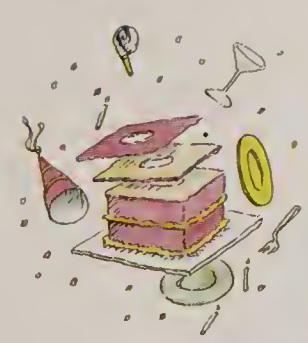
COMPUTERWORLD



20th ANNIVERSARY EDITION

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WHAT TOMORROW HOLDS

It is a newspaper's duty to print the news and raise hell.
— Chicago Times, 1861.

How much does today's *Computerworld* hold in common with its very first issue, published 20 years ago this month? This is best answered with another question: What does this year's computing community share with the data processing shops of the past two decades?

In one sense, *Computerworld* has not changed at all — and that is in its dedication to provide computing professionals with essential information on events that reshape their environment.


BILL LABERIS

Since the turbulent days of the late '60s, the computer industry has grown faster and changed more rapidly than any other business in modern history. *Computerworld*'s charter has been to stay one step ahead of this change. Thus, in another sense, *Computerworld,* like the industry it covers, has been in a constant state of flux.

In remaining true to its mission and charter, *Computerworld* has earned a nickname from our readers, one we're proud of — "the bible of the industry." Through the years, we have labored to provide information that professionals trust, information on which they have based significant strategic decisions.

We have never taken our responsibility more seriously than we do today, when our readers demand order from changes that are more frenetic than ever.

Bill Laberis

REMARKABLE 20 YEARS

No one knows *Computerworld* like its founder Patrick McGovern, chairman of International Data Group. He recently talked about CW's past, present and future.

Why did you begin *Computerworld?*

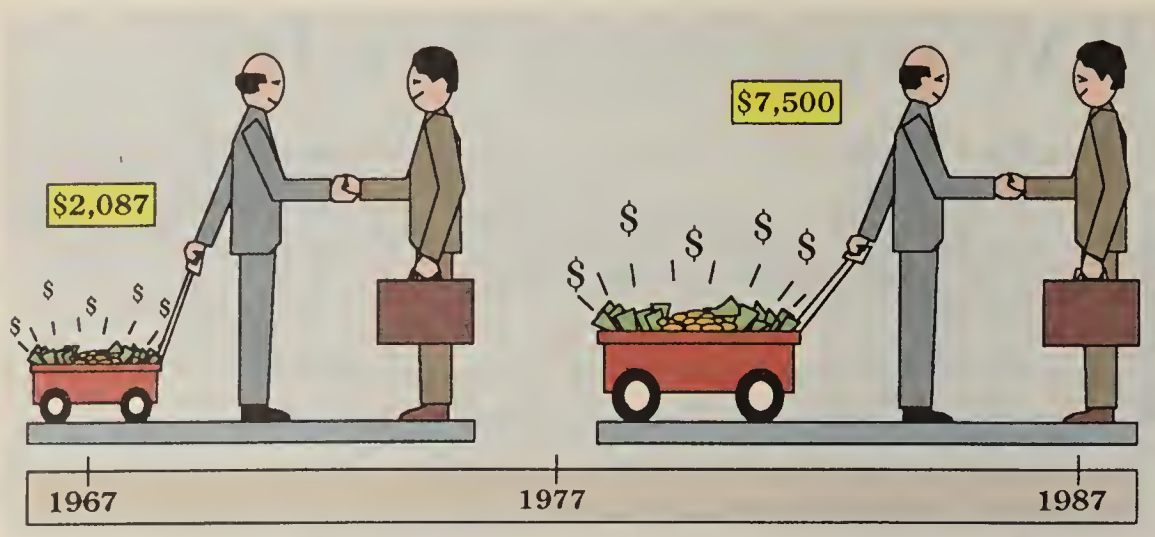
In late May 1967, I was in New York visiting the DP managers of a number of large user organizations. I discovered these managers were having difficulty getting enough information to evaluate vendors other than their own suppliers. I realized that if the industry was going to grow, and innovative new products succeed, DP professionals would need a timely vehicle to inform them as to the new products and services available. I conceived *Computerworld* as the users' advocate, a newspaper reporting on new products and the successes and failures of their use.


PATRICK MCGOVERN

How did users react?

Our subscribers found our editorial content a refreshing change, providing insight they could rely on. We were willing to sharply criticize products and vendors — something our competition was not noted for. I am proud to say we still have that reputation 20 years later.

Continued on page 20th/2



1967 INFORMATION PROVIDED BY DEUTSCH AND SHEA, INC.
1987 INFORMATION PROVIDED BY L.A. SILVER ASSOCIATES
CW ILLUSTRATION: SUSAN ALDAM

Average cost per hire of DP professionals

• The amount the average company spends to hire a data processing professional increased 259% since 1967

Continued from page 20th/1

How did the competition react?
Competitive publications didn't pay much attention to us. No one expected *Computerworld* to succeed against major competitors like *Datamation*. Then, six months later, a circulation study found that *Computerworld* was more widely read than any other computer publication. The study also revealed that it was very influential in helping users make their buying decisions. By 1972, we had the largest ad revenue in the industry.

How has *Computerworld* changed?
Computerworld's basic mission has not changed. We still support the needs of information systems professionals and their staffs; we are not tied to a particular technology, like many of our competitors. We conduct readership surveys to stay in touch with our audience. Today, you'll see articles on a variety of topics that are important to our readers.

What is the No. 1 challenge facing your readers today?
In the past, our readers were responsible for managing systems that were completely under their control. Today, computing power has spread outside the data center. MIS professionals must balance the management of centralized processing with distributed processing, dealing with training, security, PC acquisition. *Computerworld* runs regular features to help readers deal with these challenges.

What do you think the future will be like for the information community?
Over the next two decades, computing power will become directly available to more than one billion people. They will rely on computer technology for information retrieval and communications in the same way they use the telephone and broadcast media today. People's personal and economic accomplishments will be tied to their knowledge of computing.

In business, the MIS professional's role will continue to expand as he supports the strategic direction of the company. Even today, we see chief information officers making high-level policy decisions. More companies will require a worldwide strategy for information systems development and management.

What role will *Computerworld* play in this future?
Computerworld's role, as it is today, will be to help those individuals charged with harnessing the power of information technology. Twenty years from now, it will reach a much broader audience. As information technology becomes an indispensable part of decision making in every industry, we will see the number of professionals grow. We will track their needs and design *Computerworld* in response to them, just as we do today.

What also intrigues me is the potential of delivering *Computerworld* electronically. Some information will be presented to our readers in a packaged format, organized by our editors and writers or compiled on data bases available at the request of users. *Computerworld* will increasingly use on-line delivery, video and voice messaging as well as printed media to deliver information to our readers in the right form at the right time.

WITHOUT DATA GENERAL, INTEGRATING YOUR SYSTEMS IS LIKE MIXING OIL AND WATER.

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To maintain a competitive edge, a business needs to integrate all its resources. Ultimately blending people, departments, data and computer systems together.

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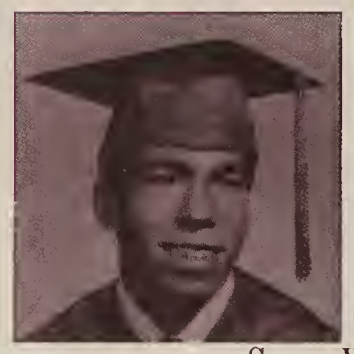
Data General
a Generation ahead.

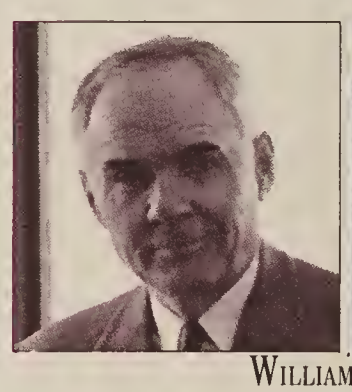
Where were you in '67?

Twenty years ago, the Boston Computer Society's Jonathan Rotenberg was learning to walk, Borland International's Philippe Kahn was learning to ski, and Apple Computer's Steve Wozniak was walking down the aisle in his high school graduation cap and gown.

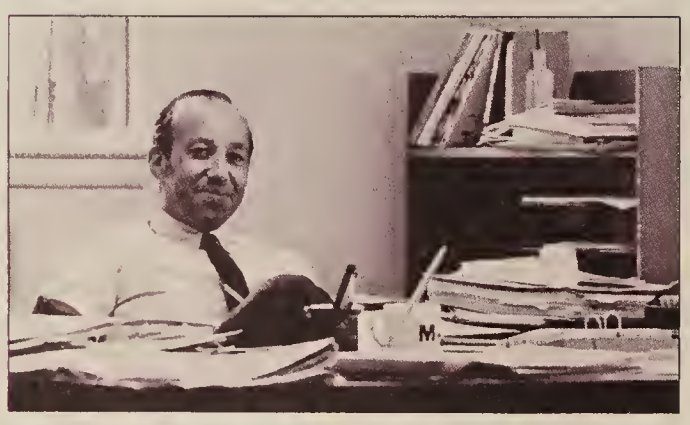
At about the same time, Gene Amdahl was working for IBM and Adam Osborne was completing his Ph.D. in chemical engineering. Our industry leaders have packed a lot of experience into 20 years. Here is a look, past and present, at a few familiar faces.

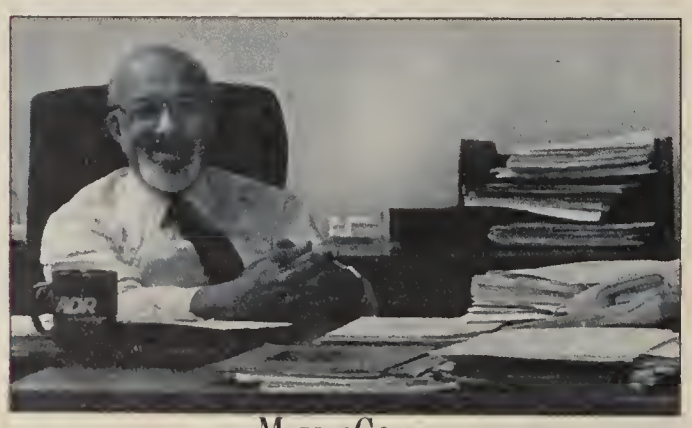


STEVEN WOZNIAK
Apple Fellow and Cofounder
APPLE COMPUTER, INC.



WILLIAM NORRIS
Chairman Emeritus
CONTROL DATA CORP.





MARTIN GOETZ
Senior Vice-President
APPLIED DATA RESEARCH, INC.

THOMAS KURTZ, JOHN KEMENY
Kurtz: Chairman of Computers and Information Systems
Kemeny: Professor of Math and Computer Science
DARTMOUTH COLLEGE

AN WANG
Chairman
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FRED WANG
President and Treasurer
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SOFTWARE GARDEN, INC.

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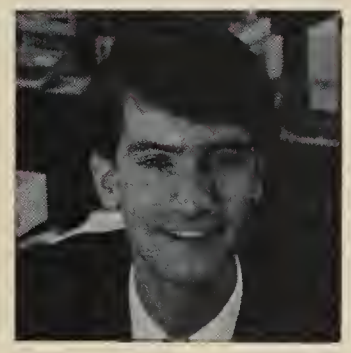
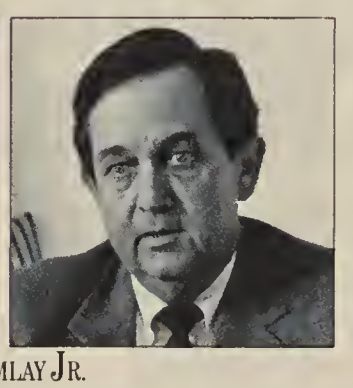
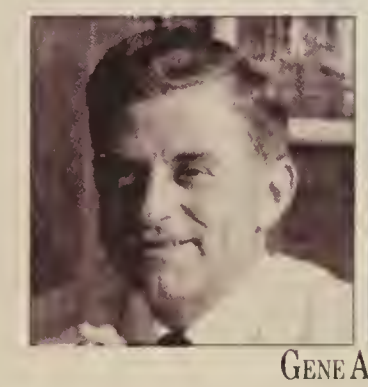
PAPERBACK SOFTWARE, INC.



JONATHAN ROTENBERG
President
BOSTON COMPUTER SOCIETY



JOHN IMLAY JR.
Chairman and CEO
MANAGEMENT SCIENCE AMERICA, INC.



GENE AMDAHL
President
MODULAR POWER CORP.

The many faces of Computerworld

H. ROSS PEROT
Industrialist/Founder
ELECTRONIC DATA SYSTEMS CORP.

JOHN SCULLEY
Chairman and CEO
APPLE COMPUTER, INC.

GARY KILDALL
Chairman
DIGITAL RESEARCH, INC.

EDSON DECASTRO
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DATA GENERAL CORP.

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BY MICHAEL HAMMER

Back to the future

What was the world like when the first MIS amphibian crawled out of the primordial ooze? What did it see when it raised its head? Hardware.

An "oxymoron" is not a dull-witted bovine but a phrase that contains an internal contradiction, such as "jumbo shrimp," "airline food" or "information systems management." Accordingly, a cynic might argue that asking, How is the management of information systems changing? is akin to asking, When did you stop beating your end users? But we are not cynics, and so we shall ask that question and seek to resolve it.

The checkered history of information systems is replete with its own myths, epochal events and great ages. In the beginning, there was the Classical Era (10,000,000 B.C. to A.D. 1972), also known as Pax Cyberneticus. During this period, computers were enormous and expensive devices, the mysteries of which were revealed only to the initiated. They were established in great Grecian temples, surrounded by barbed wire and ministered to by cults of priests in long white robes known as systems programmers.

If you were a member of the peasantry — such as a business manager — and wished to consult the great oracle for information or support for a business function, you had to bring a freshly slaughtered goat to the temple and knock your forehead on the ground three times. Perhaps you got your information, perhaps you got your support, but you certainly did not get your goat back.

This era was followed by such legendary events as the Persecution of the Users and heroic periods like the Age of the Robber Barons.

Therapy groups for MIS victims

The legacies of this history persist even today. I recently learned that at a certain Fortune 10 company, DP was the most hated part of the organization. This did not particularly distress or surprise me until they added "even worse than the controller." In a similar vein, I am sometimes called upon to run therapy groups for users who have been traumatized by their experiences with MIS. When the participants are asked to free-associate and provide the words that MIS connotes for them, such submissions as "ponderous," "slow," "unresponsive," "out of touch" and "managed by weirdos" usually top the list.

Yet as Stalinists, Hegelians, Red Sox fans and other historical determinists would say, "It is no accident." That is, the problems afflicting MIS and its relationships with users are not coincidental, not the by-product of bad policy on the part of MIS management, but rather the inevitable consequences of the systems environment with which we have had to contend. If we are to remedy these problems, we need to understand their origins and how changes will allow us to free ourselves from the dead hand of history.

Organizations, like organisms, are products of their environments. What was the world like when the first information systems amphibian crawled out of the primordial ooze? What did it see when it first raised its head? It saw hardware. In brief, the hardware was expensive, complex, large-scale, environmentally finicky and marginally reliable. Other than that, it was terrific. And software? Because of the limitations of the hardware, our only objective was getting the damn stuff to run on the pokey machine. So we used primitive tools and endured unendurable interfaces and sacrificed nights on the altar of throughput and response time.

And to what noble purposes did we put these technological behemoths? For what business activities were these marvels of the modern world used? For bookkeeping, for financial accounting, for the administrative automation of the back office. You remember the back office — that endless wasteland of filing cabinets, cheap desks and glaring lights. The back office is the part of the organization in which we do the work we need to do to stay in business, not the work we went into business to do.

The real work of a company revolves around product design, manufacturing, planning, marketing and sales. As a by-product — or waste product — of this work, every company finds itself saddled with billing, invoicing, accounting, payroll and similar tasks. These back-office processes are large-volume, repetitive, highly structured and labor-intensive. Our motivation in automating them was straightforward: to arrest the relentless increase in their costs that accompanied the dramatic growth in business volume and revenue that characterized the '60s and '70s. In fact, computing technology was the only weapon in management's arsenal to combat the diseconomies of scale associated with the administrative paperwork processing of the back office.

As an illustration, consider a situation in which an organization has to process 100 transactions per hour and has access to clerks who can individually handle 10 transactions per hour. Advanced mathematics demonstrates that 11 people are needed in the unit that will process the transactions: 10 clerks and one supervisor. Now imagine a tenfold increase in volume to 1,000 transactions per hour; How many people are needed now? Arithmetic suggests 110, recursive function theory 111.

However, survivors of organizational growth know that the correct answer is 193: 100 clerks, 10 supervisors, one department manager, three deputy department managers, 18 people in a human resources organization, 19 people in long-range planning, 20 in facilitation and expediting and 22 in audit and control. This growth reflects not only the inevitable bureaucratic proliferation of a large organization, but also the complications that result from scaling up any labor-intensive work.

Systems were necessary, but not important

Back-office processes are not unnecessary activities, but they are relatively unimportant in the larger scheme of things. They are ancillary to the organization's primary focus. The purpose of the organization is not to pay the payroll (unless the organization is Automatic Data Processing, Inc.). Admittedly, it is difficult to motivate employees to come to work in the morning unless they are paid with some regularity, but that is the means, not the end. In short, while systems were necessary, they were not important. The computer was viewed by the rest of the corporation as less interesting than the copying machine, and the DP staff was viewed as people not creative enough to be bookkeepers.

DP responded to this environment by erecting and retreating behind a high wall that separated it from the rest of the organization. On our side, the primary concern was the care and nurturing of the machines. Keeping the damned things

Hammer is principal at Hammer and Co., a Cambridge, Mass.-based consultancy that specializes in the development and application of information technologies.

GEOFF O'CONNELL

TODAY'S SYSTEMS ENVIRONMENT CANNOT BE MANAGED FROM BEHIND THE HIGH WALL, HAMMER MAINTAINS.

THE MIS MANAGER EMERGES FROM THE INSULATION OF THE OLD-STYLE DP COCOON, NOW INTEGRATED INTO AND SUPPORTIVE OF THE LARGER ORGANIZATION'S GOALS.

JERZY KOLACZ

Flashbacks

JULY 26, 1967

ARE WOMEN A PROBLEM?

Computerworld's Personal Page editor suggests that women are a problem in the field of data processing. He says that women create problems for others and find problems for themselves.

He adds, "A woman among men can be a dove among crows, and it's a manager's job to keep it that way."

NOVEMBER 29, 1967

MY CUSTOMER ENGINEER? HE'S DOWN AT HIS TV SHOP!

Computer Communications, Inc. adapts standard black-and-white television sets as communications stations, or operator display stations. President Robert Fagan looks to the day when general-purpose computer TV terminals will be as common as electric typewriters at secretaries' desks and will be used to access files in computers located miles away.

MAY 1, 1968

COMPUTER SERVES 113 AT ONCE

The Dartmouth College Kiewit Computation Center in Hanover, N.H., sets what it believes to be a world record when it connects 113 simultaneous active users to its General Electric Co. 635 timesharing system with no perceived degradation in response time.

AUGUST 28, 1968

FIRST MAN TO SWIM BAY HAS HELP FROM COMPUTER

Forty-one-year-old Russell Chaffee, an eighth- and 10th-grade math teacher from Sayre, Pa., uses a computer to plot the tide flows of Cape Cod Bay and steps ashore as the first person to swim the 19-mile bay nonstop. The trip takes him 14 hours. Chaffee credits a computer study he did with saving five or six miles of swimming.

JUNE 11, 1969

L.A. COURT UPHOLDS RIGHT TO SUE DP SERVICE

The Los Angeles Superior Court rules that plaintiffs have a legal right to sue computer service companies for punitive damages. Judge Robert W. Kenny upholds Southern California Retailers Credit Service Co.'s claim against Statistical Tabulating Corp. for $1 million in punitive damages and more than $2 million total.

running and implementing any application more complicated than a sort routine occupied all our energy and attention. We had none to spare for the masses on the other side. In fact, the world beyond the wall had no objective reality for us; it existed only as specifications for our Cobol code.

Not surprisingly, communications between the two worlds were limited and usually accomplished by missives thrown over the wall — requests and authorizations on their part, specifications and completed systems on ours. MIS and the user did not understand each other nor speak each other's language. On those rare occasions when we met users face to face, the resulting conversation consisted of a series of mutually unintelligible grunts:

User: The EVP is concerned about our costs of funds and the Fed's plans for Regulation Q, so we'll need a system to play the gap.

MIS: The distributed free space in VSAM is breaking along segment boundaries, and the double page faults are killing file system performance.

User: Huh?

MIS: Huh?

Priests of High Seriousness

Living behind the wall, we became cautious and conservative to a fault. We suppressed our natural inclinations to see the computer as a device for our own amusement and systems development as an esoteric form of intellectual amusement.

Rather, we managed our responsibilities with a High Seriousness, employed a methodology for every task in sight and documented and audited like the obsessive-compulsives we were quickly becoming. We became inner-directed, solipsistic, introverted. Our watchwords were control and discipline, and our apotheosis was the system programmer: Totally embroiled in the mysteries of the machine, contemptuous of the "real world" he deigned to serve.

After a time, we even made a virtue of our predicament. It was good to live behind the wall, we decided. After all, we were not in the banking business or the automobile business or the textile business or whatever business our users of the moment happened to be in. We were in the systems business, a "business within the business." Our users were our customers, and our mission was to deliver the products that they requested of us.

Saying 'cheese'

While this customer-oriented view required us to smile a bit more at users than would have been our natural wont, it also provided us with a satisfying image of self and a self-contained definition of our enterprise. The Great Wall of China was built to keep out the barbarians. Our wall had the same purpose, but who is to say on which side the barbarians lurked?

Our sheltered information systems workshop has stood us in good stead for many years, but it is unable to withstand the winds of change now blowing at gale force. While the change factors bringing about its demise are many and diverse, three stand out above all:

• Technology change. This is The Cause that drives all others. Despite the efforts of the many pundits, it is impossible to make this a vacuous cliche. The 10,000-fold improvement in price/performance that we have witnessed has had dramatic effects on system availability, affordability and manageability; it has given us the excess capacity needed to reduce the complexity of applications development, to develop systems with less painful interfaces and to employ tools that shield us from the vagaries of the hardware.

Above all, technology improvements have enormously expanded the scope of information systems, allowing us to implement facilities that in the past were either uneconomical — word processors, spreadsheets, decision-support systems — or simply unfeasible — integrated manufacturing systems, customer communications systems.

• User empowerment. In the Golden Age, users would cower under their beds if we growled, "JES3" or "VTAM." Today, they are likely to sneer and start talking about Unix and PS/2. Users have decided that computers are in fact comprehensible by mere mortals. They feel enormously more comfortable using systems and are far more interested in seeing them employed in their business environments.

• New application types. A new generation of applications is now being implemented. These contemporary systems come in two major flavors: support systems and transformational systems.

Support systems encompass the technologies that go by the names of personal computing, information centers, decision-support systems, office automation and a long list of other buzzwords that grows daily.

The essence of support systems is that they do not attempt to automate processes but to leverage people. By providing professionals and managers with information and the tools to use it, support systems allow people to perform their jobs in different — and presumably better — ways.

Transformational systems are those in which information technology is used to introduce basic change into fundamental business processes: sales, marketing, manufacturing and research and development. Rather than increase local efficiency, transformational systems entail global restructuring of an organization and its activities in order to achieve new — and not just faster or better — ways of doing things.

Transformational systems include most of the "competitive" or "strategic" applications that have given the trade press something about which to write now that everyone is thoroughly tired of hearing about personal computers.

Both support and transformational systems represent the utilization of systems in the essence of the business rather than just in the back office.

Tear down the wall

These basic changes will force us to tear down the wall behind which we have hidden for so long. In the past, the wall did not seriously interfere with our ability to develop systems, because the systems we were building were in fact relatively simple: To be precise, we were automating already existing administrative processes.

It was not necessary to speak the same language as the users or to understand them; with hand signals, they could point to the processes to be automated, which we could examine in operation and replicate in software. Yesterday's systems development environment was in fact relatively clear. The users knew more or less what they wanted, and our job was to build it for them.

Flashbacks

DECEMBER 3, 1969

ANTIWAR PROTESTERS ERASE DOW TAPES

Beaver 55, a group protesting the Vietnam War, erases more than 1,000 tapes at a Dow Chemical Co. computer center, charging that the tapes were used to store data from "research into such areas as nerve gases, napalm, defoliants and other secret chemical weaponry."

Dow denies the charges.

JULY 1, 1970

DP CENTER NOISE MAY CAUSE LOSS OF HEARING

A National Bureau of Standards investigation reveals noise levels in computer centers frequently cause permanent hearing damage in addition to "relatively simple errors by programmers."

DECEMBER 8, 1971

U.S. COMPUTERS 'AID' APARTHEID

The American Committee on Africa implicates computers as the chief U.S. contributor to South African apartheid. Under a Population Registration Act passed by the South African Parliament in 1970, the government will computerize a record system to compile dossiers on all South African blacks. The system will run on an IBM 360/50.

FEBRUARY 16, 1972

MAGNETS' DANGER TO TAPE 'HOGWASH'

Researchers at the Stanford Research Institute dismiss fears that an intruder carrying a concealed magnet could wipe out a tape library as "hogwash." This is not to say that magnets cannot erase tapes — anyone carrying a 100-lb magnet into a tape library could do considerable damage, but such a person, researchers point out, would hardly go unnoticed.

MARCH 22, 1972

JUDGE RULES AGAINST 'DP ERROR' DEFENSE

A company is responsible for the actions of its computer, the 10th Circuit Court of Appeals in Denver says when it rules against State Farm Mutual Insurance Co., which claimed it was not liable under a canceled insurance policy that was renewed by the firm's computer system.

AUGUST 22, 1973

DP WORKERS STRIKE FOR BETTER STATUS

Some 45 Rhode Island state government programmers and keypunch operators stage a wildcat three-day "sick-out" to protest their lack of advancement opportunities.

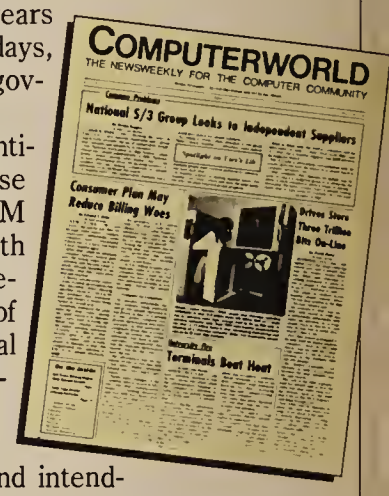
MARCH 6, 1974

NIXON WANTS PRIVACY SHIELD FOR ALL

President Richard Nixon orders a top-level review of the issue of personal privacy — particularly in relation to computerized data banks — and calls for "a personal shield for every American" against invasions of privacy.

MAY 28, 1975

GOVERNMENT OPENS ANTITRUST CASE AGAINST IBM


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
National S/3 Group Looks to Independent Suppliers
Consumer Plan May Reduce Billing Woes
Drives Store Three Trillion Bits On-Line
Terminals Beat Heat

After six years and 122 days, the U.S. government's massive antitrust case against IBM opens with the U.S. Department of Justice legal team charging that "IBM monopolized and intended to monopolize the general-purpose electronic digital computer systems market" and related peripherals and leasing markets. Justice charges that IBM had the power to fix prices from 1960 to 1972. Frank T. Cary listens impassively to the charges against the $1 billion-a-year firm he heads as chairman.

DECEMBER 24, 1975

POLICE SUED; OUTDATED NCIC FILE CITED

Failure to update the National Crime Information Center's (NCIC) wanted-persons file results in a $100,000 lawsuit against seven police officers. A Dover, N.H., man claims he was "rousted" from bed and shepherded to the local police station where he was questioned for four hours by officers who said his name matched an alias in the NCIC's file.

AUGUST 16, 1976

WORLD SEEN APPROACHING 'DATA SPASM'

The world is barreling toward a "data spasm" of transnational data flow that operates under no restraint or accountability, according to Joseph Overton, legislative assistant to Rep. Barry Goldwater Jr. (R-Calif.), who spoke to attendees at the International Conference on Computer Communication in Toronto.

This happy state of affairs no longer obtains. Modern systems are not implemented from a predetermined set of specifications; they evolve in a process of mutual adaptation between user requirements and systems capabilities.

The user of a modern system does not know exactly what he needs of a system when he asks for it. He vaguely understands the potentials of information technology, but he does not comprehend how his personal activities or business operations can be radically changed through the power of systems. The user may express to us his articulated wants, but not his unrecognized needs.

Contemporary systems are distinctive in that they are disruptive. They provide users with capabilities the users never had in the past; the systems themselves created the needs they satisfy. They force the user to rethink how the essence of his business can be conducted. Such systems must be developed in an environment of learning and feedback, an environment not consistent with high walls.

And if by some chance we do get a system developed, throwing it back over the wall is not a satisfactory way to conclude our involvement with it. Today, systems entail substantial organizational change. They do not leave their environments undisturbed. Rather, they result in significant changes to individual work styles, job definitions and organizational boundaries.

Out from behind the high wall

Today's systems environment cannot be managed from behind the high wall. We no longer have the luxury of waiting for users to come to us with fully articulated needs. In the first place, they may not come to us at all, emboldened as they are by their apparent successes with PCs; they may undertake the effort on their own. And if they do come to us, they may not know what to say. Users once said, "Build what we ask for." Now they say, "Tell us what we should ask for."

It is incumbent upon information systems to sally forth from behind our ramparts and to get deeply involved in the world beyond the wall. Tasks are no longer neatly divided between the users and ourselves — needs identification and systems implementation to the user, design and development to us.

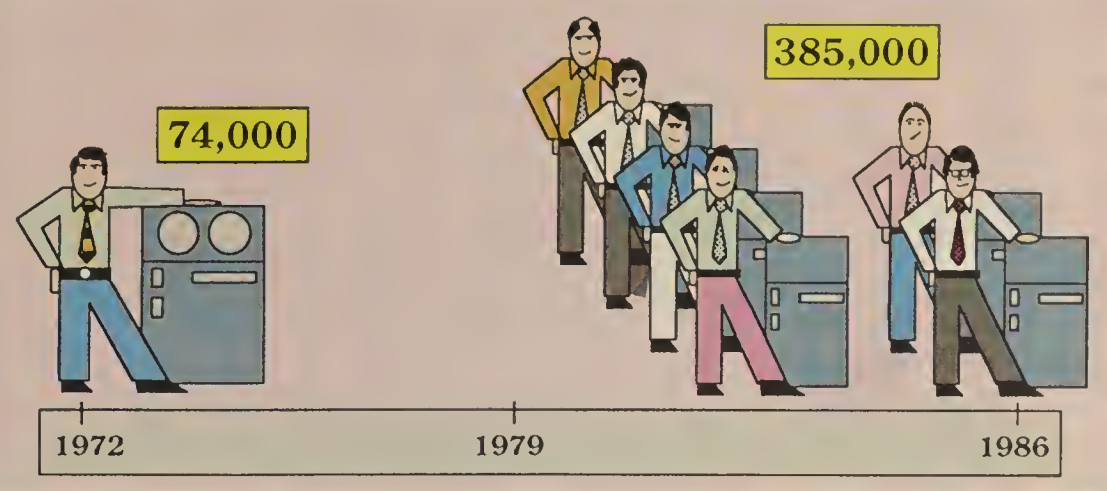
Rather, we must work in partnership with users on the entire process, from the initial business analyses that identify general system requirements through the management of the organizational change that is inevitably attendant on an important system.

Down from the tower

This is much more than a cosmetic change. On the one hand, the scope of information systems activities will broaden considerably beyond the traditional confines of technology management. On the other, we will no longer have sole dominion over the technology domain, since today's user feels empowered to participate with us there.

Our business will no longer be computer systems; our business will be the same as the larger organization of which we are a part, and computer systems will just be an area in which we have a bit more competence and a bit more expertise than do our colleagues — not users or customers.

This transition is not a modest one. We have embarked on a new enterprise with a new mission, new responsibilities and new requirements. In the old days, our



INFORMATION PROVIDED BY THE U.S. BUREAU OF LABOR STATISTICS, OFFICE OF ECONOMIC GROWTH AND EMPLOYMENT PROJECTIONS
CW ILLUSTRATION: MITCHELL J. HAYES

Demand for systems analysts skyrockets

• The number of systems analysts employed has boomed since the census began counting computer occupations, with 420% growth in 14 years

definitions of success were clear: availability, response time, system delivery on time and under budget. What the user did with the system after delivery was his problem; as long as the system worked, we did not care whether the intended business benefits were in fact achieved. This perspective is now obsolete.

Our mission must be to help ensure that the users achieve business success, however we can best contribute to it. We will have to become intimately involved with the users and their business and work in close harmony with both.

This role will demand new skills: business analysis, methods engineering, change agentry. Even more important, it will require new styles and attitudes not normally associated with MIS. Our new role will demand humility, since we will no longer be able to point to an independent enterprise and declare it ours; rather, we will play a supporting role across all business domains.

We will also need to cope with a different set of pressures. In the past, our role model was Mr. Spock: rational, analytic, precise. We thrived despite overwork and disaster, but we could not tolerate ambiguity and imprecision.

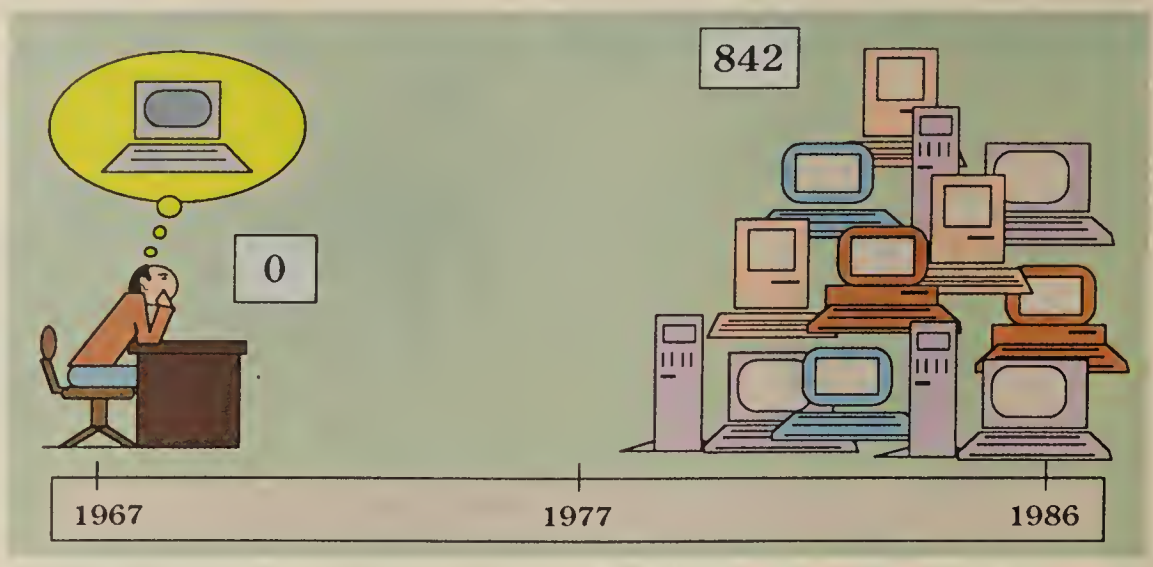
Relinquish the Vulcan grip

Yet these are precisely the characteristics of the broader world we now inhabit; initial uncertainty compounded by permanent indecision is the hallmark of modern systems. We will need to be able to enter a situation in which no one has a clear idea of what needs to be done, and instead of attempting to impose order, structure and discipline on a chaotic environment, we will have to go with the flow, providing direction even when the destination is not in sight or even identified.

We will also need to provide leadership for the corporation as a whole. MIS will be among the primary agents for innovation in the organization. Companies everywhere are struggling with the contradictory needs of drastically reducing costs and dramatically improving quality. It is only through the redemptive power of information technology that these objectives can achieved. It will be our job to understand our users' businesses so well that we can recognize their needs even before they do, show them what technology can do for them and lead them into exploiting it.

Traditionally, the highest praise sought by an information systems organization was that it was responsive to its users. While this was presumably better than being unresponsive, it is now far from sufficient. We will have to be proactive and aggressive. MIS must champion the innovations that systems will engender and steer these innovations through the rocky channels of implementation and acceptance. This will require aggressiveness, perseverance, political savvy and selling skills — traits not normally included in an IMS Internals curriculum.

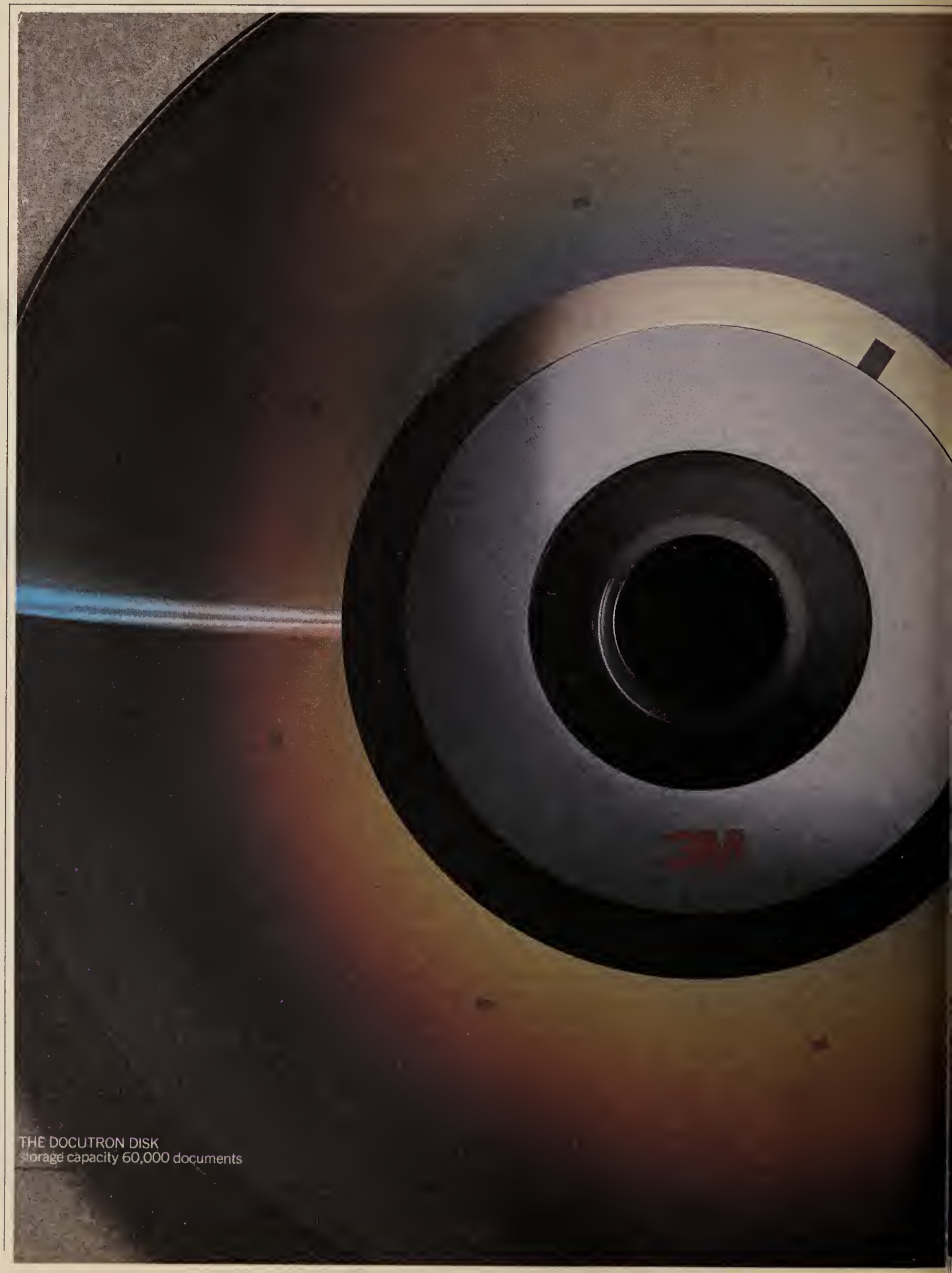
This is a tall order. Some might say it will require a personality transplant, others a lobotomy. But we have no choice. The Age of the High Wall is over, and we must brave the world that lies beyond it. If we do not, another oxymoron will describe us: "the living dead." But we should not be overly terrified of the uncertainties that lie ahead. W. Somerset Maugham wrote, "It is bad enough to know the past; it would be intolerable to know the future." Stick around; it won't be boring. •

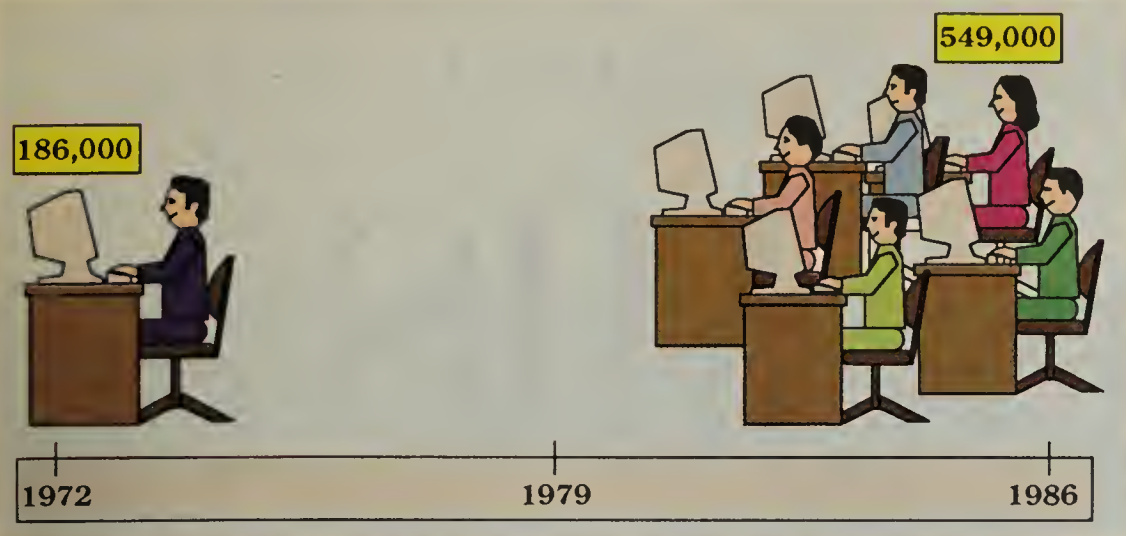


INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW ILLUSTRATION: MITCHELL J. HAYES

Installed personal computer models: Single-user systems

• The personal computer was not around in 1967, but in 1986 the MIS manager could choose among 842 unique systems





Programmers on the rise

• The demand for programmers, based on the number employed, has grown 195% since the census started counting computer occupations

INFORMATION PROVIDED BY THE U.S. BUREAU OF LABOR STATISTICS OFFICE OF ECONOMIC GROWTH AND EMPLOYMENT PROJECTIONS
CW ILLUSTRATION: SUSAN ALDAM

Flashbacks

JUNE 27, 1977

CONGRESS BLASTS FBI SWITCHING PLAN

A barrage of congressional criticism forces the Carter administration to withdraw its endorsement of the controversial message-switching system.

The system, proposed by the Federal Bureau of Investigation, would funnel National Crime Information Center-related administrative messages to and from the nation's local and state law enforcement units. Members of Congress blast the proposed system as the beginning of a "national police state."

AUGUST 29, 1977

DP CENTER BOMBINGS PLAGUE ITALY

Computers are "instruments of the capitalistic system" — and must be destroyed.

That dire message is the thread that links an unprecedented wave of political computer center bombings by the Unita Combattenti Communiste (Communist Combat Unit).

The bombings have been directed toward corporate and state computer installations in Italy during the past 10 months — a wave that has left in its wake more than $5 million in damages.

JANUARY 23, 1978

USERS AWARD XEROX, AMDAHL TOP GRADES IN SURVEY

Computer equipment from Xerox Corp. and Amdahl Corp. garner first and second place honors, respectively, in overall user satisfaction in Datapro Research Corp.'s survey of computer users.

What makes these results especially noteworthy is that Xerox no longer even makes or supports its computer systems, and Amdahl Corp. is a relative newcomer to the computer-equipment business.


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Majority of Women DPers Find No Job Discrimination
IRM Moves to Fixed Disks

BY ASHLEY GRAYSON AND JOHN VORNHOLT

The new MIS

As management learns more about DP, and vice versa, the traditional lines will blur, and MIS will be poised to play a larger role in corporate decision making

"To stay where you are, you must run as fast as you can. To go anywhere else, you must run faster yet." — The Red Queen to Alice in *Through the Looking Glass.*

Today's MIS director is a human relations expert, punching bag, technology wizard and highly visible manager in the upper ranks of most companies. And while it is still true that experience counts in MIS, these days the wisdom of the ancients is good for about three months. "Every time I think I understand my job, they introduce something new, and I start over," muses William Strowbridge, vice-president of management information resources at Dataproducts Corp., a printer manufacturer in Woodland Hills, Calif.

"Ten or 15 years ago, you could explain the problems you were having with punch cards or data files, and no one would understand. They'd walk away confused, mumbling," Strowbridge explains. "Today, you get a request from a user to change a simple report, and you talk in terms of six to eight weeks of a five-step systems-development methodology. He rolls his eyes back, walks out and does it himself."

Strowbridge says such initiative shown by users is probably healthy because it makes MIS more cost-competitive. But while it may be healthy, it is just one more thorn in an MIS manager's side. After all, controlling disparate systems within organizations is more difficult than managing old-style computer rooms, and managers today must keep track of and manage not only their central systems but also a myriad of micros, workstations, departmental systems and the communications net that connects them all.

In addition, the technologies on the market and the pressures from upper management are also quite different. In days past, says Gary Rinehart, manager of information technologies for San Diego Gas & Electric Co. (SDGE), "staying current in the data processing department often involved planning for the next generation of mainframes." But not so today, he says, when most of information services' work represents a fairly substantial hit on the bottom line.

MIS is much more likely today to have to justify their expenditures because upper management is more systems savvy. "Some look at information systems as a strategic weapon against the competition — others think it's a millstone around their necks," Rinehart says. "New mainframe technology comes under particular scrutiny because today's management is more comfortable with computing. They're asking, 'Why do we want to do things faster? How much is it costing?' "

But MIS pros are overcoming these management obstacles, and their jobs are reflecting a wider horizon than previously imagined.

Strowbridge, like many MIS professionals today, has responsibilities not always associated with data processing. "We've pulled a few other things into it," he says. "I have travel, telephones, the mail room, just about anything that moves information. We find a lot of synergy among all kinds of information, being able to see how it all fits together — even mail and facsimile. I think it gives us an ability to optimize our efforts."

Changes in SDGE's MIS structure reflect another DP group that has broadened its horizons. "The blending of data communications, telecommunications and the computer center is taking place constantly," Rinehart says. Three years ago, SDGE brought its telecommunications group into the information services group, and the relationship continues to grow closer. In fact, a planning group combining information systems and telecommunications personnel now exchanges information and plans regularly.

Microcomputers, almost 400 of them, are also a part of SDGE's total system support. While an

Continued on page 20th/18

MARK REINSTEIN/GAMMA LIAISON

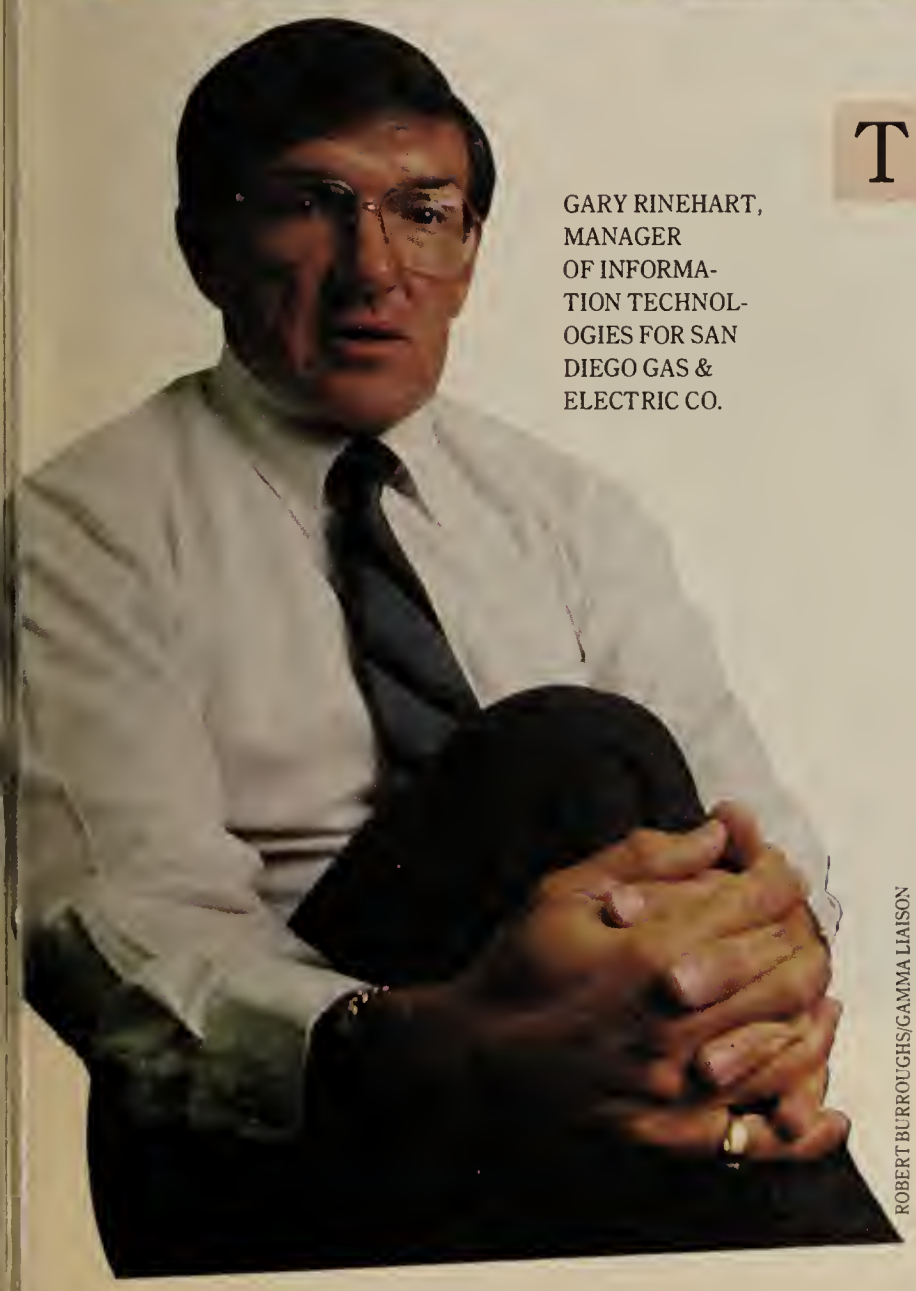
WALTER DULANEY, CORPORATE INFORMATION SERVICES, BALLY MANUFACTURING CORP.

Grayson is president and Vornholt is project manager at ADG, a San Pedro, Calif.-based literary agency.

If you give users the right tools, chances are they will do an outstanding job with them. The danger is that they can create islands of information, doing so in a vacuum.

WILLIAM STROWBRIDGE, VICE-PRESIDENT OF MANAGEMENT INFORMATION RESOURCES AT DATAPRODUCTS CORP.

ERIC SANDER/GAMMA LIAISON



GARY RINEHART, MANAGER OF INFORMATION TECHNOLOGIES FOR SAN DIEGO GAS & ELECTRIC CO.

ROBERT BURROUGHS/GAMMA LIAISON

TIMELINE: *Software*

1967
Cobol and RPG face stiff competition from a new computer language called Adpac, which claims to best Cobol by eliminating the Data Division and improve upon RPG by providing additional language elements.

1968
The U.S. Patent Office issues the first patent for a computer software program to Martin Goetz, vice-president of Applied Data Research.

Consultant John Cullinane founds Cullinane Corp., which introduces the $10,000 Culprit, a report writer for IBM mainframes.

1969
Rear Adm. Grace Murray Hopper is named the first recipient of the Data Processing Management Association's Computer Sciences Man-of-the-Year Award.

IBM unbundles applications software, languages and systems software, indirectly launching the independent software industry.

AT&T Bell Laboratories develops the Unix operating system.

1970
John Imlay rescues Management Science America from Chapter 11 proceedings and turns the company around in a year's time. MSA would later evolve into the largest applications software company in the world.

The Patent Appeals court broadens the criteria for patenting software to qualify computer

Continued on page 20th/18

ILLUSTRATION BY CHRIS DEMAREST

ACCESS
SNAPP

"We sell power equipment. And now we've got a powerful system to handle our information management needs. It's a secure feeling to know that your development tools are as good as the people you hire to use them."

Hexie McDonnold

Hexie McDonnold
Director of Data Processing
Snapper Power Equipment
A Subsidiary of FUQUA
Industries, Inc.

IDMS/R.
ER DID.

Mowing down the competition in the outdoor power equipment business takes more than quality products. The efficiency of accessing information throughout the organization is what ultimately puts you on the cutting edge. That's why Snapper – a DOS shop – turned to Cullinet's IDMS/R.

By replacing their COBOL system with Cullinet's integrated relational architecture, Snapper has been able to maintain large databases and provide everyone instant access to information. And with ADS/OnLine – Cullinet's fourth-generation programming language – Snapper has been able to cut and trim applications development time and costs.

Cullinet's comprehensive information management technology is the root cause of some impressive Snapper results. A new bill of materials format, for example, now provides both engineering *and* production data with up-to-the-minute accuracy. IDMS/R has improved access to inventory, order status, current pricing, current costs, finished goods status and credit information.

Snapper's small staff has been able to develop large claim services – including group medical and co-op advertising, promotions and warranty service credits. And Snapper has found greener pastures in IDMS/R's automatic recovery feature that ensures availability of data.

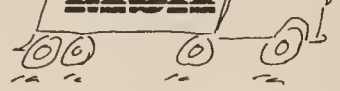
For more information on how your company can access Cullinet through IDMS/R, call toll-free 1-800-551-4555. Or write to Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2198.

Cullinet

An Information Technology Integrator
For The 80s, 90s And Beyond.

From page 20th/15
programs that describe a method rather than just a process.

1971
Digital Equipment Corp. and Carnegie-Mellon University



develop and implement Xcon, an expert system that configures VAX-11/780 computers on a daily basis for DEC.

Pascal, named after the famous French mathematician, is developed by Niklaus Wirth as a programming language for systems development.

1972
Nolan Bushnell, parlaying a $500 investment, launches Atari, Pong and the multimillion-dollar video game industry.

1973
Cullinane Corp. (later known as Cullinet Software, Inc.) introduces IDMS, a major data base management system product.

Software AG of North America is founded. Its first product is Adabas, a high-performance data base management system.

1974
The U.S. Court of Customs and Patent Appeals rules that a software system is patentable matter when it is claimed as an apparatus or a part of an overall system.

1975
Microsoft Corp. is founded by Bill Gates and Paul Allen after they adapt the Basic programming language to the Altair micro.

1976
SAS Institute releases Base Statistical Analysis System.

Gary Kildall and Dorothy McEuen form Digital Research to sell Kildall's CP/M operating system, which he was previously selling through a hectic mail-order business.

1978
John Barnaby creates Wordstar, which becomes a standard for microcomputer word processing.

Dan Bricklin and Bob Frankston create Visicalc, the first electronic spreadsheet software, marketed by Software Arts.

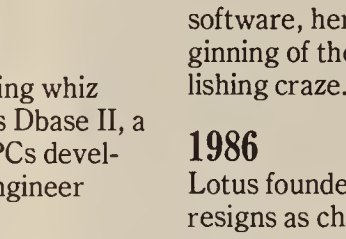
1979
The Department of Defense announces completion of the Ada language, designed for real-time scientific and systems applications.

1980
Cincom Systems' Total DBMS breaks the $100 million sales barrier, a first for a single program product.

Relational Software introduces the Oracle relational data base management system, launching a new breed of DBMS and adding "relational" DBMS to the list of buzzwords of the '80s.

Relational Technology, Inc. adds its offering to the relational DBMS fray — Ingres.

1981
IBM commissions Microsoft to design an operating system for its new PC, and MS-DOS is born.



Software marketing whiz George Tate sells Dbase II, a DBMS for 8-bit PCs developed by NASA engineer Wayne Ratliff.

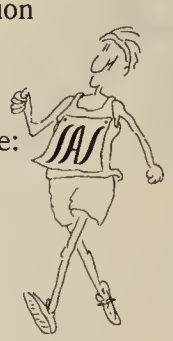
Artificial Intelligence Corp. introduces the first commercial AI product — Intellect — a natural-language query, analysis and reporting tool.

1982
Mitch Kapor and Lotus Development Corp. introduce the $495 1-2-3 integrated software package for the new IBM PC 16-bit processor.

1983
Lotus's 1-2-3 takes Visicalc's place as the popular spreadsheet program.

Multimate International's Multimate word processing software bows, as does Microsoft Word for the IBM PC and compatibles.

Fourteen-year-old McCormack & Dodge introduces Millenium, the first applications development and execution environment offered by an application software vendor.



Affordable PC software takes the stage: Adam Osborne founds Paperback Software International, and Borland International introduces the $49.95 Turbo Pascal — a compiler and integrated programming environment for PCs.

1984
Despite all the fanfare, this year's generation of multifunction software — such as Lotus's Symphony and Ashton-Tate's Framework — gets a lukewarm reception.

1985
Ashton-Tate acquires Multimate and its tremendously popular Multimate word processing package.

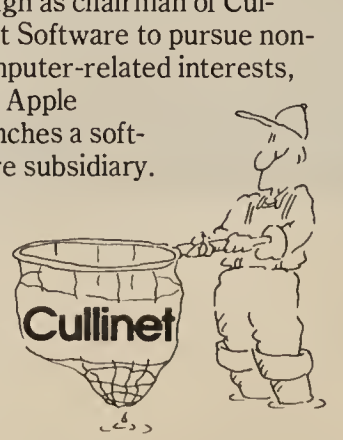
Managers of software systems programming garner the highest salaries of all U.S. DP employees, with applications programming managers coming in second, according to an Administrative Management Society survey.

Aldus introduces its $495 Pagemaker page-layout software, heralding the beginning of the desktop publishing craze.

1986
Lotus founder Mitch Kapor resigns as chairman of the company.

1987
IBM announces its graphics-oriented operating system, OS/2. A month later, IBM signs a 10-year software marketing and development deal with Lotus to put 1-2-3 on mainframes.

In the same April week, John Cullinane announces plans to resign as chairman of Cullinet Software to pursue non-computer-related interests, and Apple launches a software subsidiary.



ILLUSTRATIONS BY CHRIS DEMAREST

Continued from page 20th/15
information center provides basic support, traditional information service professionals are encouraged to play a role in PC support. Rinehart, a proponent of PCs in the work force, claims the DP professional is sometimes slow to accept the micro. "In order to take full advantage of the PC, you must have a team effort," he says. "Not only should the people within the information center be involved, but also the professional data processors who can assist their client base in using that machine."

MIS at SDGE is investigating how PCs might be effective in their environment. Specifically, they are looking at the PC as a workstation for program development and examining the place of two- and three-tier data processing in their shop.

PCs also have a strong presence at Dataproducts, and Strowbridge, like many MIS professionals, views them with a mixture of respect, awe and trepidation. The company attempts to guide microcomputer use without squashing the end user's creativity. Dataproducts' technical support staff evaluates micro products to create company standards. The users are then encouraged to work within those standards, applying their own talents.

"Instead of trying to control and discipline users, we take a very liberal, supportive role of micros and local-area nets," Strowbridge explains. "The user community is very creative and they know their jobs. If you give them the right tools, chances are they will do an outstanding job with them.

"The danger," he says, "is that users can create islands of information and do it in a vacuum. If it's not in concert with a strategic plan, it can get a company into serious trouble." Managing micros, Strowbridge says, is like walking a tightrope. "It should be encouraged if you set the proper boundaries and disciplines, but what you are looking for is a comfortable compromise between total freedom and total bureaucracy — like we've known with mainframes."

But what are those boundaries? For Strowbridge, they include "identifying the host-based applications that cannot be duplicated on a micro," and then allowing the mainframe data to be downloaded onto PCs for further analysis. Mainframe access at Dataproducts is formally controlled; how and when it can be allowed is planned between the PC users and the application project leaders.

For Ed Hodgson, manager of computing and communications at Westinghouse's Livingston Computer Center — a computing and communications services branch of Westinghouse Elevator Co. in Livingston, N.J. — the micro boundaries include "trying to get the users to plan with us and let us know what their intentions are. They can have a computer in two weeks, but if they want RS-232 communications, it may take us 30 days to get the line drivers in stock."

One way Westinghouse MIS management deals with end-user requests is through their information center, which answers many basic user requests. Technical problems are handed over to Hodgson's group.

But even with an information center, Hodgson, a 34-year MIS veteran, has found that easy-to-use micros are not necessarily easy to manage, especially since so many of those PCs are remote and their users demand to be networked and go on-line. "Micros pop up like weeds and are just as uncontrolled," Hodgson claims. "You don't really know there's one there until they say, 'I'm ready to communicate.' Helping a remote on-line user with a computer problem is often like telling a kid how to tie his shoes over the telephone."

But Hodgson is also quick to admit the need for such small systems. Micros are helping out in Westinghouse's field sales offices, where they are replacing older systems and, in fact, Hodgson admits even he uses one.

"Communications was a foreign world to the data processing community 20 years ago," Dataproducts' Strowbridge claims — but not so anymore. Communications technology is now intertwined in MIS systems, and networking jargon is integral to an MIS manager's vocabulary.

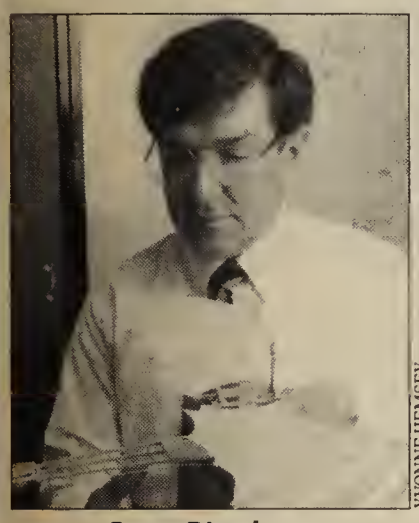
'Pseudo-networking'
At Bally Manufacturing Corp., a Chicago-based entertainment and recreation conglomerate, Walter DuLaney, director of corporate information services, combines local-area networks, a Digital Equipment Corp. Vaxcluster and PC packages to give users access to the micro software they want to use. "Pseudo-networking" is what DuLaney calls this hybrid of PCs and host computers, a combination that lets Bally's end users take advantage of "the tremendous amount of PC software — tax and accounting packages, treasury cash management systems and business support tools."

Bally uses microcomputers as workstations that can access the host — the Vaxcluster — while running PC software. Bally does legal reverse-engineering of PC software by analyzing the flow of data and routing it to mini disks that are set up on the Vaxcluster. In effect, DuLaney follows classic system analysis with PC files. His staff looks at a PC file in the host and defines it as shared, not shared, write update, read update and so on. All of this work is done on a file level, not on a record level, so the company achieves compliance on all

software contracts.

Once the files are on the VAX, they have the same directory structures they would have on the average Disk C available on a hard disk. Because the remote disks are on a host, DuLaney's users have unlimited storage. Also, the PC files on the host can have the sharing characteristics found in a mainframe environment, including access protections and restrictions.

"We don't have hard disks in the PCs at all — we remove them. We just put the data out on the host. This allows people to share report files, master files and updates. The boss can stay in his office and review whatever he likes," DuLaney says. "We've taken the PC package that you buy for very little and have made it multiuser, at least for data. We're not interested in full networking, because that defeats the convenience of running PC software on a PC."



YVONNE HEMSEY

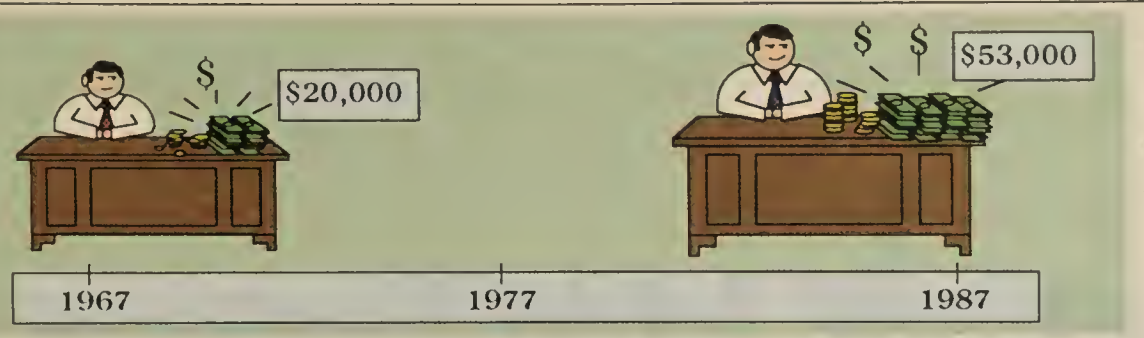
Gary Rinehart

DuLaney does not try to enforce software standards — the users acquire whatever they need. "The managers are intelligent enough to evaluate the functional merits of software," he says. "There's no way you can tell a professional not to buy a tool that fits the job."

Another vital part of the new MIS manager's responsibilities is the ability to communicate well with both systems staff and end users. "If you create an environment where data processing people understand the user's job, what he's trying to achieve, you can positively contribute to educating him in using the technology," Dataproducts' Strowbridge says.

DuLaney agrees. To make his PC/host network work, he and his staff had to gather user support. MIS has to be up front with users, he says, because the process of setting up such systems can be slow and somewhat painful, and users — as well as management — have to realize what is involved.

But as MIS learns more about management and management learns about MIS, the traditional lines will become blurred, SDGE's Rinehart says. "Management involves decision making, and MIS is poised to play a larger part in corporate decision making in the future." •



INFORMATION PROVIDED BY ROBERT HALF INTERNATIONAL, INC.
CW ILLUSTRATION: MITCHELL J. HAYES

Average MIS manager starting salaries

• The average salary for MIS managers has jumped 165% in the last 20 years

PROFILE BY JEAN BOZMAN

Banking on DEC

Twenty years have brought Bankers Trust's Stanley Rose from bit pusher to worldwide DEC hardware manager

Twenty years ago, Stanley Rose was an MIT graduate learning to program one of Digital Equipment Corp.'s first minicomputers, a PDP-1. He had a degree in electrical engineering because computer science was not available as a degree when he went to school. At the same time, a small Massachusetts company named Digital Equipment, founded by other MIT graduates, was gaining a following in universities, research laboratories and hospitals as a small but capable scientific processor.

In the years since, Rose's career in computer administration has, in some unique ways, paralleled the growth in power of DEC's computers. In the late 1960s, Rose worked at Boston's Massachusetts General Hospital, programming DEC PDP-7s and PDP-8s. In the mid-1970s, he moved to a Wakefield, Mass., medical software house called Automated Health Systems, where he developed software programs for hospitals. In 1977, he moved into banking by joining Bankers Trust Co. in New York. Still, he kept working with DEC processors and increasingly with the new generation of VAX machines that gradually replaced DEC's PDP-11 series of minicomputers.

Today, at 42, Rose is a vice-president at Bankers Trust, one of the 10 largest banks in the U.S., with $58 billion in assets. Bankers Trust has operations all over the world, with major data centers in London, Hong Kong and Sydney, Australia. Each of these international data operations runs DEC computers, many of them high-end VAXs. They form the backbone of a worldwide Bankers Trust data network that handles as much as $100 billion in transactions per day.

Rose leads the Distributed Processing Technical Support group, which manages nearly 100 VAX machines, ranging from the high-end VAX 8700s to the low-end Microvax II. The computer rooms in the bank's New York headquarters hold one of the largest commercial configurations of DEC machines anywhere, and Rose was more than happy to provide a quick tour of those computers recently. Altogether, Rose estimates that Bankers Trust has more than 100 million instructions per second's (MIPS) worth of VAX equipment, which is nearly equal to the number of MIPS provided by the bank's four IBM 3090 mainframes.

As part of its responsibility, Rose's technical support group handles all DEC hardware purchases for the bank's international data network. It also provides support to the bank's many end-user organizations and coordinates requests for vendor maintenance. The group is the prime focus of all Bankers Trust's interactions with DEC, Rose says, and acts as the principal negotiator for all DEC equipment and software coming into the company.

Whether dealing with hardware or software products, Rose is thoroughly familiar with the DEC product line. To keep current, he takes trips — often monthly — to DEC's home base near Boston. Among his frequent stops are DEC's facilities in Merrimack, N.H., and Littleton, Mass., where DEC engineers design the VAX machines and communications products.

Currently planning a more extensive journey — an around-the-world tour of the bank's data centers — Rose looks back on the ways in which the growing power of DEC machines has enabled Bankers Trust to expand its business both here and abroad. There are dozens of DEC VAXs in the lower Manhattan offices of One Bankers Trust Plaza, where Rose works. There are dozens more across the Hudson River in Jersey City, N.J., within sight of Rose's corner office, which also overlooks New York Harbor and the Statue of Liberty. The New Jersey machines are connected by T1 cables.

There are even more computers scattered around the globe, which are also part of the Bankers Trust system. They are connected by long-distance lines and by satellite links. Today, DEC is able to support and service Bankers Trust's far-flung computers and to fill the role of international vendor on a par with IBM, Rose says. But looking back 20 years, that outcome would have seemed highly unlikely. "I don't think anybody had any inkling that DEC would become that large," Rose says. "That's because no one knew how powerful a small machine could become."

Those small machines were the PDP-11s. They were interactive, bus-based systems that were built up in a modular fashion. If more capacity was needed, more PDP-11s could be carted in and linked together.

"A programmer of the early PDP machines," Rose says, "had to be an excellent bit pusher. He had to be able to know the hardware inside and out, to know where the data was, to be able to manipulate data registers and device drivers." That is because programs were written then in machine language or recompiled from a set of basic instructions. The concept of fourth-generation languages, with their layers of built-in code generators, was still many years away.

Rose admits to being one of those bit pushers in the late 1960s and early 1970s. "You didn't study computer languages back then, you studied techniques," he explains. "You wrote in assembler, and you

PHOTOS BY YVONNE HEMSEY/GAMMA LIAISON

ROSE, OVERSEER OF ABOUT 100 MIPS' WORTH OF VAX EQUIPMENT, SAYS FEW FORESAW DEC'S PRESENT SIZE TWO DECADES AGO.

Bozman is *Computerworld's* Chicago-based Midwest correspondent.

To use Grace Hopper's analogy on systems clustering, when a farmer needs more ox power to plow his field, he doesn't get a bigger ox, he gets another one. Then he puts the oxen in parallel.

wrote compilers." And sometimes, Rose adds, you had to be a bit of a mechanic. "There were plenty of times in the old days when I would have to get on my back and pull out a module from the PDP-11. Today, you couldn't do something like that. The static electricity on your hand could zap the whole machine."

But if PDP-11s were modular, they were also quite small by today's standards. Memory was much more expensive then, and machines were shipped with 512K bytes or less. Terminal support from each PDP-11 was often 32 ports at maximum. "In order to increase your capacity in absolute numbers, you had to buy a lot of systems," Rose says. That was the case until the power of the VAX architecture changed DEC's presence in the computer room.

The first large-volume shipments of the VAX-11/780 came in the spring of 1978. The 11/780's 1-MIPS capacity changed everything about managing a DEC shop, and Bankers Trust's was no exception. The addition of VAXs meant that raw computer horsepower suddenly began to take off, boosting the capacity of the bank's DEC-based international trading system. Today, high-end VAX 8700s run at about 6 MIPS.

Overall computer capacity in DEC machines has quadrupled since 1984. And in VAXs alone, capacity has increased by a factor of six in the last three years. But even as new VAXs are added, Rose says, the older DEC machines are still running their original applications. He displays with pride one group of older PDP-11/70s that are still running a 1976 application alongside their RPO6 series disk drives. These machines drive a money transfer system — the very first application of DEC technology at Bankers Trust.

"Everybody thinks that they'll bring in a new machine first and get rid of the old one later," Rose says. "But because the older DEC equipment is not obsolete, we still find uses for the older machines. I don't think we've released more than one VAX-11/780 since we've brought the newer VAXs on-line."

DEC's strategy of maintaining a single VAX operating system, DEC VMS, has meant that Bankers Trust is able to cluster the older VAX-11/750s and 11/780s alongside the high-end VAX 8600s and 8700s. "Our biggest cluster is made up of eight processors, all running VMS 4.5," Rose says. The machines include a VAX 8700, 8600, 8500, 8200 and a VAX-11/750.

In the future, Rose maintains, such clustering will become the preferred way of managing multiple computing resources. To explain, he describes an analogy used by retired Rear Adm. Grace Murray Hopper, a pioneer in compilers and programming during World War II who is now a consultant for DEC in Washington, D.C. "To use her analogy, when a farmer needs more ox power to plow his field, he doesn't get a bigger ox," he says, "he gets another one. Then he puts the oxen in parallel.

"We can't keep building machines bigger and bigger, because you begin to run into very real limitations, such as the speed of light," Rose explains. "What DEC has done is to provide clustering as well as peer-to-peer networking through Decnet, so that the network doesn't need to have one boss."

In many IBM networks, the high-end IBM 3090 mainframe is the boss, surrounded by several IBM 3725 front-end processors that manage an overall IBM Systems Network Architecture data network. The kind of side-by-side computing used in the Vaxcluster is simply not possible in most of the IBM world.

VAX clustering may be an advanced networking concept, but it is also a balancing act. Bankers Trust operations managers know that they need to keep operating system software current on all clustered machines. "DEC tells you that you must run the same release of VMS on all machines, with the possible exception of an upgraded machine," Rose says. "But we have learned that you cannot run a release that's more than one version away from the other copy of VMS." Otherwise, an application that runs smoothly on one machine may run into trouble on another.

The area of applications software is another that has seen great changes since the late 1960s, Rose says. In his days at Mass General, Rose worked on refining DEC's own MUMPS language for hospital and laboratory word processing applications. "At that point, people weren't even beginning to address the standards issue,"

Continued on page 20th/23

Flashbacks

NOVEMBER 6, 1978

DONALD DUCK CLEANS UP IN HUD AUDIT

It is an affair like no other — the "Walt Disney Affair" — in which the Department of Housing and Urban Development's IBM 7074 issues Donald Duck a $99,900 paycheck.

The General Accounting Office was investigating possible abuses in federal overtime pay when it purposely added Donald and 29 other cartoon characters' names to the HUD payroll as part of an audit check.

FEBRUARY 26, 1979

COMMANDO-TYPE RAID FREES TWO HELD IN IRAN

Two employees of Electronic Data Systems Corp. (EDS) held hostage by the Iranian government are freed in a commando-style raid organized and financed by EDS Chairman H. Ross Perot and led by U.S. Army Green Beret Col. Arthur (Bull) Simons.

Iran seized the EDS employees in an effort to force the facilities management firm to return to the Middle East.

NOVEMBER 19, 1979

NORAD SYSTEM GOOFS, CALLS ALERT

The North American Air Defense Command (Norad) launches a secret investigation to determine what went awry when its experimental computer system mistook a simulated missile attack for the real thing.

Norad swears its technicians are not at fault and instead blames its Honeywell, Inc. 427M top secret computer.

JANUARY 21, 1980

DP CUTOFF TO SQUEEZE SOVIETS

By cutting off high-technology exports to the Soviet Union, President Carter crimps Soviet plans to deploy data processing capabilities on a widespread basis in Soviet society, according to a Central Intelligence Agency report.

JULY 14, 1980

AMDAHL, NASCO TOPS IN IBM's RATINGS

Documents produced in the *U.S.* v. *IBM* antitrust trial reveal that IBM considers large-scale systems from competitors Amdahl Corp. and National Advanced Systems Corp. superior to its own.

Flashbacks

FEBRUARY 23, 1981

COMPUTERS TO FUEL SHUTTLE LIFT-OFF

Plagued by numerous minor failures as well as malfunctions in its army of computer systems, the space shuttle *Columbia* is set to lift off in April.

APRIL 20, 1981

ACLU SLAMS REAGAN'S DATA BANK PLAN

The American Civil Liberties Union assails a Reagan administration plan to ferret out welfare fraud by creating a computerized national data bank to list the identities of 25 million Americans who are listed as receiving public assistance.

JANUARY 18, 1982

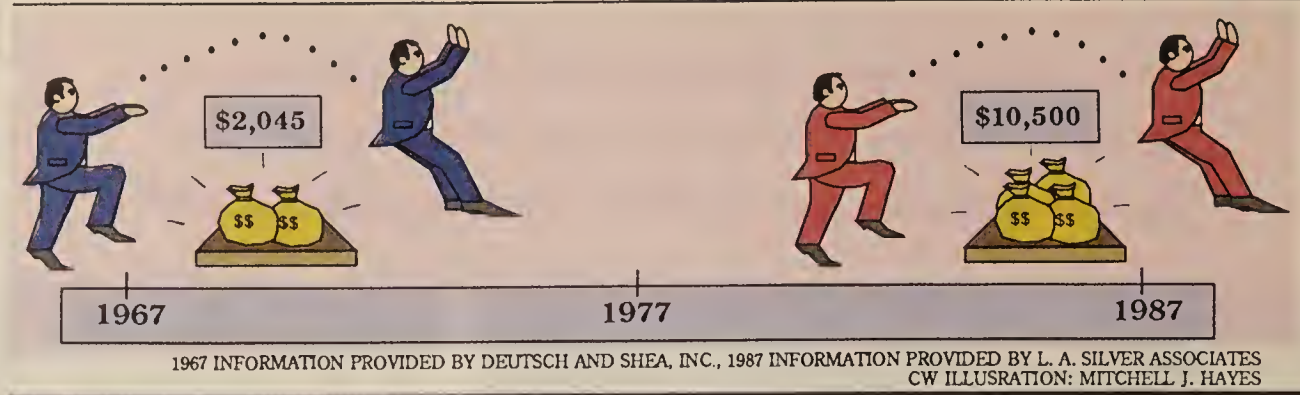
U.S. v. *IBM* RESTS, ALSO SETTLES WITH AT&T

Two major legal battles between the government and the high-tech industry come to an end.

After 13 years and nearly 5,500 pages of transcripts, the Justice Department drops its landmark antitrust suit against IBM.

The U.S. also settles its 7-year-old antitrust suit against AT&T, transforming Bell from a telephone company to an information company.

The agreement requires Bell to divest its 22 wholly owned subsidiaries.



1967 INFORMATION PROVIDED BY DEUTSCH AND SHEA, INC., 1987 INFORMATION PROVIDED BY L. A. SILVER ASSOCIATES
CW ILLUSRATION: MITCHELL J. HAYES

Average cost per relocation of DP professionals

• The average company spends 413% more to relocate a data processing professional today than it did in 1967

Max Headroom for president in year 2000

By Philippe Kahn
President
Borland International

I won't be writing anecdotes — and you won't be reading *Computerworld* — in the year 2000.

There won't be anything like the term "computing" found in the human psychabulary: Vocabulary will have gone the way of other primitive forms of communication. Oh, there will be some kind of machine in existence that will have evolved from the ancient PS/2 and Macintosh II computers. They'll be the drones of civilization.

Society will focus on play. Max Headroom will be the supreme monarch, and we'll see him on the big screen in the sky. Max will have struck a deal with IDG Communications to distribute an editorial caplet — take one a day to keep up with the latest advances in technology.

We'll be battling it out with nasty competitors from Planet Zorg who oppose the new mindware standards set forth by the Committee on Brain-Damaged Machines. And Timothy Leary will have established a multibillion-dollar software empire based on intelligent artifice and led by an electronic board of directors from a galaxy called Armonk. •

Two decades old, computer systems may have only just begun

By Ralph E. Gomory
Senior vice-president
and chief scientist
IBM

Despite the extraordinary progress we have seen through the years in information technology, today's computing machines are merely the beginning of a future that promises a steady stream of advancements.

Just as today's desktop workstations are as powerful as the largest computers of 15 years ago, by the year 2000 workstations will exist that are comparable in capability to today's largest mainframes.

For example, even what I call an "electronic book" — a book-size object with a flat touch-sensitive screen, a marker for writing on it and storage for the equivalent of 300 novels — is well within the range of what the technology can provide in this time frame.

From small to smaller

The computer industry is fundamentally different from most other industries. All we do is deal with marks, or bits, if you like, and the only limit is how small we can make these marks and still read them. Since 1970, we have come from storing 1,000 bits on a field-effect transistor memory chip to one million bits, and we may well be close to another factor-of-1,000 improvement by the turn of the century.

This continued progress in the miniaturization that has driven and will continue to drive our industry will require ever deeper understanding of materials, increasingly elaborate processing tools and large investments in facilities.

To users, the resulting profusion of "cheap MIPS" will mean advances like the following:

• Workstations that accept more natural inputs, like handwriting and speech, replace text and symbolic outputs with realistic displays of the end result and provide an open window into all the capabilities of the system.

• High-end data complexes of parallel processors will make generally available 1,000 million instructions per second and 1,000 million floating-point operations per second simultaneously.

• Networks that integrate data and voice, exploit the synergy between workstations, minicomputers and mainframes by assigning each the task it does best and benefit from increasing attention to cross-systems consistency.

A tremendous software evolution is required to make all this computing complexity invisible to users, who will continue to see on their screens the local environment but will not know or care whether the file they request comes from down the hall or from six data centers across the continent. •

A peek at what next century heralds in software capability

By John Imlay
President
Management Science
America, Inc.

In the year 2000, our industry will have progressed geometrically in both hardware and software technology. Software will allow virtually instant access of unlimited data bases anywhere in the world. Instantaneous communications, artificial intelligence and voice/touch terminals will give users power to develop systems by conversation.

Electronic libraries of precoded modules will be accessed by voice command in building sixth-generation software. The human role will be to make decisions, show judgment, communicate and assert values in the creation of an application.

The machine will select code, logically link program modules and ask the programmer for decisions as the program builds. New code will be generated where necessary, and the machine will test and correct itself as the computer-aided software engineering program becomes paramount in the instant development of competitive computer software systems.

Standards and niches

The industry structure will consist of two types of companies. First will be large software companies ($2 billion to $3 billion), organized to serve industry segments by providing prepackaged applications and services by customer sector. By the year 2000, these companies and their products will become industry applications standards.

The second type of corporation ($50 million to $200 million) will be composed of specialized niche companies that provide state-of-the-art software within an industry segment.

New technologies such as holography will allow three-dimensional images to be produced without screens for examination by engineers, and these suspended images may be changed in size and shape by sophisticated software techniques combining lasers and computers.

Systems software as we know it will virtually disappear. Operating systems, librarians and data base management systems all will become firmware and part of the machine itself, since chips will cost less than disks, and programs and program storage will be stored in operating memory for instant access.

Because of this software revolution, industry segments will change the way they do business. Industries such as finance, insurance and investment banking will become one industry, and manufacturing will be revolutionized through robotics.

The challenge for all of us in the computer world is to remember that within this age of thinking machines and video images of each other, we must maintain daily person-to-person relationships. In spite of rapidly changing technologies, people are ultimately the key to the success of the information age. •

A few words for future MIS to live by

By Frederick A. Wang
President and treasurer
Wang Laboratories, Inc.

The integration of the four forms of information — text, data, image and voice — will be the single most powerful achievement during the next two decades. Studies we and others have done of Fortune 500 companies show that 100% of MIS money and time is currently spent on information that can only be captured electronically. Studies further show that this represents only 5% of information needed by corporate and legislative America — the remaining 95% is still paper-based.

In the next 20 years, the function of the much-touted chief information officer will crystallize. CIOs will be as familiar with the manipulation and management of image and voice then as they are with text and data today. They will aim to provide users with access to information in all its forms.

The best of these professionals will achieve this aim while, at the same time, hiding the

Continued on page 20th/23.

True confessions of a software program in the year 2000

By Nicholas Zvegintzov
Editor
Software Maintenance News

I made my programmer cry tonight. She has been my programmer since I was a tiny kludge on the edge of the system. In those days, she was feisty and skittish, and she was going to get rid of me.

She surely tried! A lot of what you see around here are her attempts. Those specks on the counter? They're what resulted from when she tried to rewrite me in a language she learned in college; there's nothing left but the specks.

Then she tried to convert me. Bless my soul, I went to church! Outside, I was as structured as an angel; inside, I was just the same old devil spaghetti.

Once, she started an end-user park. She made pretty harnesses and hung screens and windows on a buggy and offered folks a ride, but it didn't work. Between harness and buggy, they still faced my big old back end.

Through the years, my programmer and I seemed to have exchanged roles. I'm a big kludge near the center of the system now. She's the one near the edge. Over the years, the proposals and the designs became fewer and fewer and then stopped altogether. Nowadays, she comes to work in her old soft shoes and doesn't bother to change into those pretty blue pumps. But we love each other still.

She still brings frisky little queries to share my stall. She runs my utilities twice a day and collects my garbage. She feeds me turboats on Pascal's birthday, and once she even let me watch an Ada Lovelace video!

For the last six months, we have worked together on changing the clocks so that the new millenium would come up correctly. When the ball fell in Times Square, it all went off, well, like clockwork. We put the subroutines to bed and took a byte together. I felt good, and I wanted to say something to make her to feel good, too. Instead, I made her cry.

The moment I spoke I could have bitten my buffer. It is well said that for a person and a program to love each other is to break two hearts. Humans have so little time to live and love and learn. What I said was: "Our work won't be wasted! We'll do it all again in the year 3000." •

Continued from page 20th/22
mystery of the technology from the user. Powerful desktop devices using voice recognition and interactive video will help mask the complexity of human-machine interactions. Artificial intelligence will also come of age, allowing machines to program, repair and manage other machines.

The vision of integrating the four forms of information is a straightforward one: Information shared becomes knowledge. The successful MIS professionals working toward the year 2001 and beyond need to embrace that vision, prepare strategic plans to implement it, take the necessary risks — experimenting with leading-edge technology — and remember end users' needs for simple, easy, workable solutions to their business problems. •

Continued from 20th/21
Rose recalls. "Back then, we at Massachusetts General were asking Digital to pick MUMPS up as a supported language."

Today, he says, the focus is on building systems, not on inventing them. "Our work has shifted from bit-pushing to the packaging of products," Rose says. "We want to make those products available for applications."

Those applications are written by specialists in the bank's various business center programming groups. Rose's technical support organization serves as a resource to those programming groups, advising them on additions to their computing resources or helping to diagnose software problems.

Bankers Trust bases its applications on off-the-shelf systems solutions provided by IBM and by DEC. The intent is to focus all of the bank's programming resources on applications specific to the bank's work. One advantage of this strategy is that systems are more easily maintained by DEC and by Bankers Trust staff members worldwide.


YVONNE HEMSEY
Stanley Rose

"Our goal is to stick with a vendor-supplied product," Rose explains, "unless there is a reason to go outside of it. You can always find a third-party product that fits some niche better than some other product. But if you look over the long haul and at how every piece of hardware and software has to be integrated, then you're better off going with a single-vendor solution from IBM or DEC." By relying on both major international vendors, Bankers Trust is also ensuring some measure of fail-safe redundancy in its systems designs.

If building proprietary hardware systems and operating systems is not the

Continued on 20th/24

Continued from page 20th/23

goal at Bankers Trust, then creating an overall network architecture is. "The emphasis at Bankers Trust is on networking," Rose says. "We're building applications that are distributed across the world. Decnet gives us the power and capability to do this, since the software is transparent."

One thing that is not transparent, though, is the noticeable delay in signals caused by transmitting data over such great distances. End users can generally live with delay times of a second or more, but those can be cut down by increasing the amount of local hardware in the international data centers. "We already have small systems groups in each data center," Rose explains, "and they handle all daily support." However, central network support is coordinated from Bankers Trust's New York offices, he adds.

The principle of having a large amount of computer resources in the same place means that Rose can get the maximum leverage out of his staff of 25. "That way," he says, "a small group of people can service a great many computers."

Serviced by this small group, Bankers Trust's worldwide network works around the clock. Once, international loans could be handled over a period of days without fear that the competition would be able to do the same job faster. "Now, we have a financial position that's being drawn upon from multiple locations," Rose says. London supports the bank's financial activities in France and Germany, while Hong Kong relays information from Singapore, Tokyo and Seoul, South Korea.

Today, transactions have to be accomplished in seconds in order for Bankers Trust to be truly competitive with other world banks, and the bank's on-line network allows the work to cross time zones. "As the sun sets here," Rose explains, looking out his window at the New York twilight, "we pass the books over to the Far East. And, as the sun sets in Hong Kong, they pass the books to London."

Several weeks after this conversation, Rose was set to begin his three-week tour of Bankers Trust data centers in Europe and the Far East. It is a long way and a long time from the days when Stanley Rose could check out all his machines by simply walking down the hall. •

A CHARTER SUBSCRIBER LOOKS BACK

ALAN WITSCHONKE

BILL SCEARCE

Bill Scearce, manager of customer services at New Albany, Ind.-based Key Communications Service, Inc., picked up his first *Computerworld* at the Data Processing Management Association's Boston conference in 1967. It happened to be CW's first issue. Still a subscriber 20 years later, he recently spoke with Senior Editor Janet Fiderio.

Did you think 20 years ago that you would still be in MIS and still be reading *Computerworld* today?
The idea never crossed my mind 20 years ago. It's been a very pleasant surprise.

How did you get involved in MIS?
In 1967, I was a programmer for Meidinger and Associates, a pension-consulting firm. I started as a programmer and just evolved into the user side.

What type of hardware were you working on in 1967?
It was an IBM 1130 punch card machine. It had one disk cartridge on it. The memory was relatively small by today's standards. I believe it was 16K. We stored our programs on the disk drive sometimes. Other times we fed them in with a deck of punch cards. Most of the data was input by punch cards. Now you store everything in magnetic form. It's just so much more sortable.

What was the physical environment like then?
We had the computer and all related equipment in one big office room. No special air-conditioning, no raised floor. By and large, there was no computer operator — we each ran our own jobs through the machine. We all stood in line and waited, one job at a time.

How have user requests changed in the service industry?
In 1967, users were afraid of the word "computer." Now they may not be programmers, but they understand the concept. Everybody, every elementary school kid now, has probably had some kind of experience with a computer. Some of the older adults may still be where they were 20 years ago. But the kids today, who will be the business leaders of tomorrow, all have that background. They are not afraid of the computer.

Is there anything you miss about the old systems or the old MIS?
No. I do not want to go back to the "good old days." I'll take the current days any time. The problems have changed — they're more complex — but we have more tools for handling them. •

PROFILE BY MICKEY WILLIAMSON

A manager for all seasons

Leland McGraw, Chevron's DP chief, leads his staff with a do-it-now philosophy and an aggressive management style that changes with the times

Not every change he has seen in the past 20 years has been an improvement, but Leland C. McGraw, head of information services for Chevron Corp., has no wish to turn back the clock.

"We were, 20 years ago, still in the embryonic stages of learning how to manage this business," he says. "We made a lot of mistakes over the years, but by and large we benefited from them. I'm not one to try to bring back the good old days."

McGraw, 62, is both vice-president of information technology for Chevron and president of its subsidiary, Chevron Information Technology Co. He came to Standard Oil Company of California, which later became Chevron, 39 years ago, a young MBA from the Stanford University Graduate School of Business Administration. Today he presides over $300 million worth of fixed assets and a yearly operating budget of about $240 million.

He set up the company's first centralized computer services department, oversaw the consolidation of information systems for about 15 operating subsidiaries and managed the merger of two giant oil companies' information systems when Chevron acquired Gulf Oil Co. in 1984 in a $13.3 billion deal.

The Chevron-Gulf merger taught McGraw valuable management lessons, namely, "to do the most thorough job you can in planning the front end, to think through all the various scenarios in as much detail as possible and then to share those plans with the key people involved. Planning is absolutely key," he stresses.

As soon as top management endorses a plan, the next step is to be sure that those individuals involved in implementing it completely understand "the game plan, the target, where they're trying to go and when. My experience," McGraw continues, "is that when the players understand the ground rules, it's absolutely amazing how they perform.

"I have a philosophy: Time delay does not buy you anything in my view. Once you have decided what you are going to do, then do it as rapidly as possible. It's disruptive, it causes problems, but delays buy you even more problems," McGraw asserts.

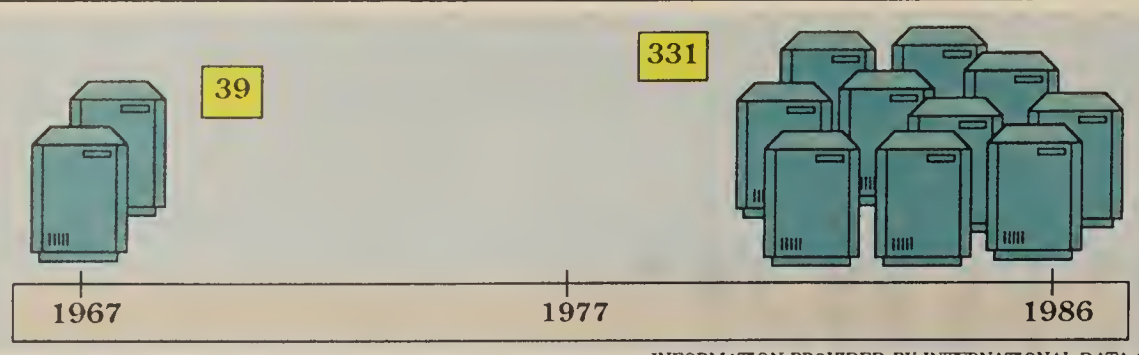
The first step he took when he was given responsibility for merging the financial and controller functions and data processing of the two companies was to form a joint Chevron-Gulf systems review team, composed of senior members of both firms with their primary responsibility being applications development.

The review team determined how Gulf and Chevron handled each application area and then recommended which system should survive in

Williamson is a technical journalist based in Warwick, Mass.

MCGRAW CAME TO CHEVRON 39 YEARS AGO, A YOUNG MBA FROM STANFORD UNIVERSITY.

CINDY CHARLES/GAMMA LIAISON



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW ILLUSTRATION: MITCHELL J. HAYES

Installed medium-scale models:

• Managers searching for a 17- to 128-user medium-scale system in 1967 could choose from 39 models; by 1986, that number jumped to 331

the new organization.

"Our goal," McGraw says, "was to pick the best for survival. Quite candidly, there was some bias to select the Chevron way if it was a close call, because we felt it would be less disruptive. There were a few Gulf applications that were survivors."

The applications review team was one of 23 reporting to McGraw during the merger. "We made some fairly extensive strategic studies as to how we should configure the data centers and the people and how they should be located," Mcgraw recalls. "There were some key decision points. Gulf had about four major data centers, and we collapsed those in less than one year into our two data centers. It was a huge undertaking."

McGraw says he realizes from experience how MIS management style has changed. "I think that 20 years ago, our management tended to be somewhat autocratic. Today, there is a greater awareness of the individuals and their needs and desires," he says. "It's a growing recognition that people, not our capital or raw materials, are really our most important asset."

CINDY CHARLES

"TODAY, the organization has grown to a size where I don't know my people as well as I used to. I miss that."

LELAND C. MCGRAW
CHEVRON CORP.

According to McGraw, the changing business climate also forced changes in management style. Managers today, he says, must be poised to respond quickly to changes in the marketplace and technology.

It is fortunate, therefore, McGraw says, that the people in MIS today are generally better prepared than they were 20 years ago. But, while it is helpful to have employees come into the company with more skills, it presents another management challenge. Not only are the skill levels of systems professionals higher today, but so are their expectations. They think more about where their careers are going, and McGraw claims management is challenged to provide

clearly delineated opportunities for advancement, an "exciting" work environment and supportive facilities.

Currently, McGraw is responsible for some 2,000 employees, 1,400 of whom are information systems professionals. His employees provide computer systems development and data processing services to virtually all of Chevron's lines of business except those engaged in geological science, oil field research and manufacturing process control.

Under McGraw, an 800-member computer applications department builds or buys and maintains the applications that run the giant oil company. The computer operation department runs two huge data processing centers, one in Concord, Calif., the other in San Ramon, Calif. The communications technology department provides voice and data communications on telephone, radio and some 6,000 miles of company-owned microwave links.

Chevron Information Technology has provided time-sharing services to the rest of the corporation for more than 15 years, offering a number of on-line applications. "And, of course, we provide a lot of support services for PCs," McGraw adds. About 5,000 Chevron employees use PCs, while more than 16,000 use the on-line time-sharing system.

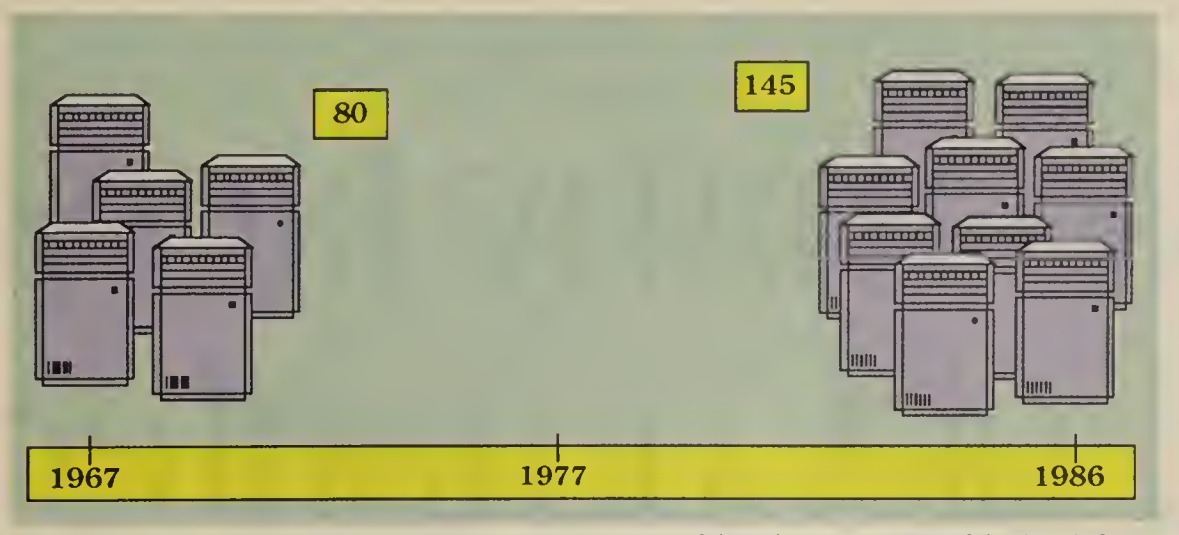
Moving toward centralization

While the bulk of Chevron Information Technology's employees are in San Ramon or Concord, some are dispersed to about 25 other facilities, including various user organizations, where they provide technical support. The organization has a strongly centralized orientation, a far cry from what McGraw inherited 22 years ago when, as assistant controller, he "first became involved in a major way with data processing."

The oil company was largely decentralized, with at least 15 distinct operating companies and "many people in different organizations working independently on the same problems," he explains. "We had, for example, at least eight payroll systems and five different credit card systems." Computer operations were eventually centralized in a newly formed computer services department, with McGraw as general manager, reporting to the financial vice-president.

The computer services department was barely 8 years old when McGraw received another assignment. The Standard Oil of California board of directors decided to absorb six independent subsidiaries into a single company, to be called Chevron U.S.A. McGraw was appointed financial vice-president of the new company, with the responsibility for consolidating the financial affairs of all six companies. It was that challenge that prepared him for the merger with Gulf Oil in 1984.

Both McGraw's duties and his management style have changed significantly during the years. Although he generally approves of the changes, McGraw is not without regrets. "We've learned and grown a lot in knowing how to manage this whole complex information function, but there is one area that I do miss," he says. "Twenty years ago, the number of people involved in information systems was much smaller, and I knew most of them by their first name. Today, the organization has grown to a size where I work hard at it, but I don't know my people as well as I used to. I sort of miss that. I think you lose something when you don't have that personal touch." •



Installed large-scale models: Systems that support more than 128 users

• While managers in 1967 could choose from 80 different large-system models, managers going into 1987 could choose from 145

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW ILLUSTRATION: SUSAN ALDAM

The many faces of Computerworld

As the computer industry has grown, so has *Computerworld*, and our design and size have changed, too. The first issue's eight pages have blossomed into more than 100 pages per edition today. A glance at these photos of CWs past and present will show how our look continues to evolve along with our coverage.

1967

Photos by Richard P. Fenton

DPMA 1967 OPENS IN RAINSTORM

COMPUTERWORLD

The Newsweekly for the Computer Community

Cambridge, Massachusetts, June 21, 1967

25 Cents

Vol. 1, No. 1

COMPUTERWORLD IS LAUNCHED

First Newspaper For The Full Computer Community

Burroughs 3500 Software Shown Publicly

COBOL, RPG Bested By New Language ?

Next Issue Next Month Weekly In September

READERSHIP TARGET 300,000

COMPUTERS TO SOLVE CONGO'S PROBLEMS ?

DPMA, 1967

The Computer Community owes a debt of gratitude to the DP for its pioneering work with the Certificate of Data Processing — surely one of the most significant items of computerdom's second decade — and for its annual showa These shows, and the seminara and workshops connected with them ere particularly suitable to practical dey-to dey problems which users find so important.

The 1967 DPMA Show is now with us, and COMPUTER WORLD presents e special photographic two pege spread on Pages 4 and 5 of this issue ea its tribute to a very worth-while organization — the Dete Processing Management Assocretion

CW TIED ITS DEBUT TO THE 1967 DATA PROCESSING MANAGERS ASSOCIATION SHOW, HELD IN BOSTON THAT YEAR. THE FIRST CENTER SPREAD FEATURED SNAPSHOTS OF SHOW ATTENDEES AND VENDORS' BOOTH PRESENTATIONS.

OUR FIRST ISSUE ROLLED OFF THE PRESSES ON JUNE 21, 1967, WITH THE HEADLINE, "COMPUTERWORLD IS LAUNCHED." THAT ORIGINAL EDITION CONTAINED THREE VENDOR ADS AND A PAGE OF CLASSIFIEDS.


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Leasco to Open First Time Sharing Bureau
Developer Claims 'Peoc' Better Than Port-Cost
Scientific Data Systems Offers Small Computer
Is System 'Theft' Scandof or Rumor?
Stocks Off 1st Time in 2 Months
On the Inside

1968


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
DPF&G and IBM Settle Suit; ADR Keeps Autoflow Rights
Nader Leads Public At ACM's Convention
Operable in Mid-70s
Bell Digital Network Predicted
System Offers More for Less
On the Inside

1970


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
NEWS IN BRIEF
'Packaged' B700s Have S/3-Like RPG, Key Entry
Rating High on CAI
IBM 370 Lease Has No Overtime Charges
Money Men Reappraise 360, Find $ Value Zero in 1978
Private Line Charges
Bell Asks Rate Revision
On the Inside This Week

1973


NEWSPAPER
Caution: CRTs May Be Eye Hazard
COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Carter Pledges Influence To Develop Privacy Policy
Firmware Lets Mini Emulate IBM 370
New Yorkers' Systems Hit Hard By Mid-Week Lightning Storm

1974

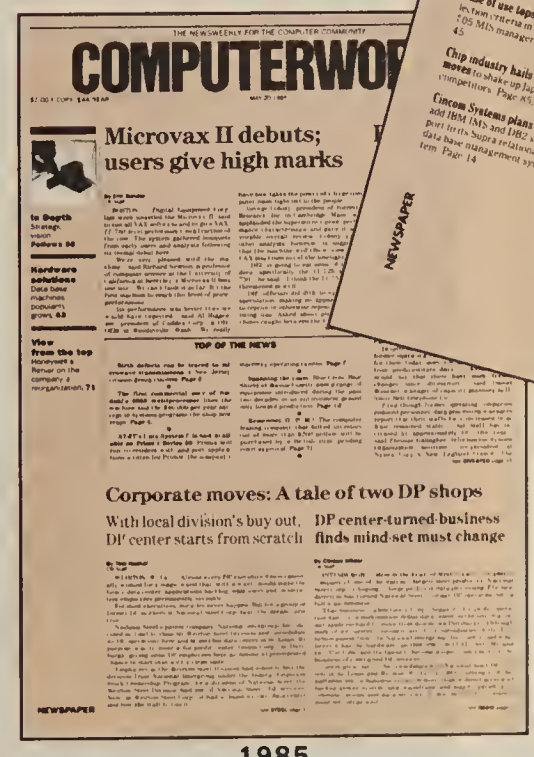

NEWSPAPER
COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
IBM Packs System/38 With Technological 'Firsts'
If Employers Take Carter Cue
Many DPers May Feel Salary Pinch
Processor Lets IBM 3270s Run on X.25 Packet Nets
MVS Insights Gained

1978

1987
COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
INSIDE
IBM stakes claim to next PC standard
OS/2 to bind PCs to hosts, leap 640K wall
Bus, disk changes anchor feature-packed systems
Announcement highlights:
CSA revamp seen luring sites back to IBM service
Telenet deal merges T1, packet nets


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
U.S. Drops IBM Suit, Settles With AT&T
• But Snag Develops as Judge Refuses to Dismiss Bell Case
• Justice Department Decides IBM Case 'Without Merit'
Pact 'Modifies' Consent Decree
Bigness Not Bad, Baxter Explains
ANALYSIS
The AT&T Settlement: Whose Victory?
INSIDE
• THE END OF THE IBM CASE: What Users Think. What Software Vendors Fear. Whether IBM Will Change How It Does Business.
• THE BELL SETTLEMENT: What Concerns Vendors, What Congress Still Wants.

1982


COMPUTERWORLD
Microvax II debuts; users give high marks
Corporate moves: A tale of two DP shops
With local division's buy out, DP center starts from scratch
DP center-turned-business finds mind-set must change

1985

CURRENTLY, AN EDITORIAL STAFF OF 52 PRODUCES *COMPUTERWORLD*, COMPARED WITH 1967's TWO-MAN CREW. THE PAPER OPERATES FOUR SATELLITE NEWS BUREAUS AND GLEANS ADDITIONAL INFORMATION FROM THE IDG COMMUNICATIONS INTERNATIONAL NEWS SERVICE.

PROFILE–BY MICKEY WILLIAMSON

Taking care of business

Cigna MIS executive Allen Loren faces the challenge of matching the insurance giant's software and systems investments to its bottom-line goals

Comparing software development today with the process 20 years ago, Allen Z. Loren, senior vice-president of insurance conglomerate Cigna Corp., says he sees "a lot more similarities than differences." Cobol is still the most widely used language, and our challenge remains one of "trying to make technology make a difference in the market."

Loren claims, however, that both his customers and the climate in which he works have changed greatly over the years. Customers, he says, have grown "smarter" as the locus of project decision making has migrated up the organization chart.

And changes in systems development have also occurred. "One big change as far as Cigna is concerned," Loren says, "is that the person making the decision is the person running the business rather than the person running the product line." Loren says he sees the product manager as a lobbyist who always wants perfection. "The person who runs the business can never afford perfection. The business manager has to make trade-offs: 'How much is this facility worth, both in terms of time and energy, vs. the other things that I want to do?' "

'Mystique has gone out of the game'

With more sophisticated customers, better tools and more options in hardware and software, Loren claims the information systems industry has become more mature. Most of all, he says, "The mystique has gone out of this game, which, I think, is good."

He adds that Cigna Systems, the company's DP arm, is run "like any other part of the business, not as if it's some kind of special art. I'm glad to see that, because you can't manage $350 million of capital with mystique. It just doesn't make any sense."

At 49, Loren is the quintessential business-oriented information systems executive. He spends his time monitoring conditions in the insurance industry and the economy as a whole and meeting with executives of the giant insurance company's various business units to ensure that the services his organization is providing match the strategic goals of the Cigna companies.

A forceful proponent of matching technological investment with business goals, Loren has served as guest lecturer for institutions such as the Wharton School at the University of Pennsylvania, the Society of Management Information Systems, the IBM Advanced Business Institute and the National Academy of Science.

Loren says he sees the proliferation of technologies as a double-edged sword. No longer do memory and storage restrictions force such painstaking analysis and design. Yet, he says, "the cheapness of memory, the cheapness of storage, have led to systems that are more complex." All this has made it possible to solve ever more complex problems.

As president of Cigna's Systems Division, Loren has good reason to know what it takes to

LOREN SEES THE PROLIFERATION OF TECHNOLOGIES AS A DOUBLE-EDGED SWORD.

Williamson is a technical journalist based in Warwick, Mass.

solve complex business problems. Cigna Systems employs some 4,000 people, about 8% of the financial services organization's work force.

Loren presides over a budget of $350 million; about half is spent on applications, and the remainder is spent on what Loren calls "running our factory — data centers, communication networks and what have you." Of the applications expenditures, Loren estimates that 55% goes to development and the balance to the maintenance of existing software.

In 1971, Loren came to Insurance Company of North America (INA) — which, along with Connecticut General Corp., makes up Cigna — after a stint as a vice-president of the Reliance Group Holdings, Inc. At Reliance, he was in charge of the software company's consulting arm.

"I sold systems development and systems operations services to government, to publishing companies, to hardware manufacturers. We built compilers and assemblers for people like Hughes [Aircraft Corp.] and DEC and DG," he says.

Within a year, Loren had advanced to vice-president and director of INA's Information Systems Division. Today, he heads an organization that provides technology support for each of Cigna's four major business groups: the Employee Benefits and Health Care Group, the Property and Casualty Group, financial planners in the Individual Financial Services Group and the Cigna Investment Group.

While Loren says he considers these four organizations his customers, Cigna has others. "There are two sets of customers here," he says. "There are internal customers, and then there are my customers' customers — outside organizations like United Technologies Corp., GE, GM and IBM. They are using our systems, or we are building systems for them, extending our technology to their playing field."

The best of two management schemes

Loren describes Cigna Systems as "vertically integrated. It is all managed out of my office, but the staff is geographically dispersed and sits next to the customer, by design." Such a setup, Loren says, borrows the best of both centralized and decentralized operations and creates what he calls a "dispersed world."

Although it was not designed to be a profit center, Loren says he runs Cigna Systems as a business, with financial accounting, chargebacks to the customer organization and an executive who manages the relationship with each of Cigna's business groups. The equipment in Cigna Systems' three major data centers — in Voorhees, N.J., Windsor, Conn., and Thornton, Colo. — is valued at more than $100 million, handles an average of five million transactions each day and is capable of storing a trillion characters of information on-line. "It's a substantial company in its own right," Loren says.

Loren's view of how to select a project for development has changed over the years. "We were very ROE [return-on-equity] oriented 20 years ago," he says, "and we are less so now. Marketing-oriented systems are hard to do ROEs on."

Development techniques have changed to some extent, too, Loren says. Fortran is used less. Every member of the staff now has a terminal to work on. A lot of development is done in CGI Systems, Inc.'s Pacbase, a fourth-generation language that generates Cobol source code and makes maintenance relatively inexpensive. Other development languages are in use as well, including Information Builders, Inc.'s Focus and "a whole litany of them," Loren adds.

Other improvements over the years include "better documentation aids, better scheduling tools, better project management tools, the manager's workstation that arms the project manager with a whole set of systems for estimating and project tracking. That's all the good news," he says.

The other side of the coin is the fact that customers' expectations keep rising, and Loren puts a considerable amount of emphasis on downsizing their demands. "Customers want the moon, and our own people like to promise the moon and deliver it in phases. We are constantly pushing them toward packaged solutions," he says.

Part of Loren's strategy is "software sharing — using systems from one of our businesses in another of our businesses. The key to that is lowering the expectation on the part of the customer. Once the customer knows that a custom job will never deliver what we say it will, even though we promise, they begin to look at other solutions. I think we have been pretty successful there," he adds, "but it's still a struggle."

Molding a development project

In approaching a development project, Loren says, "Most of our focus is on the initial scoping of the project. If we can do that well, then we can shape the work and focus it — either on an existing system that we have inside or a package on the outside."

Either way, the result is "a greatly reduced development activity," he explains.

Loren does not downplay the opportunities for productivity in the actual building phase of the development project, brought about mainly by fourth-generation languages and the writing of "reusable code" — modules that can be carried from one application to another.

But there, he says, "The potential is not as great. If we can take a project that somebody thinks is going to cost $10 million and make it $5 million through rescoping it, we've done more with a relatively few people and a short amount of time than we can with all the tools on the rest of it." •

■ FACING NEW CHALLENGES

"One of the problems we wrestle with today is managing all these diverse new technologies. In the old days, we had fewer choices. From a communications point of view, there was one vendor — AT&T. From a computer point of view, there was one technology — mainframe. So, while we had fewer tools to solve a problem, we had less trouble with those tools." — Allen Z. Loren.

TIMELINE: *Hardware*

1967
An $8,000 price tag graces the new Philco-Ford color monitor.

IBM introduces the 360/25. DEC develops the PDP-10.

1968
Univac launches the 9400 to compete with IBM's 360s.

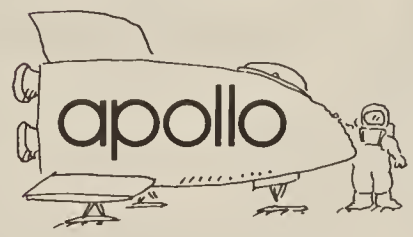
Burroughs jumps into the low-cost computer market with the B500. The system runs Cobol — provided the memory is there on the 9.6K core unit.

Edson deCastro, former DEC PDP-8 chief engineer, starts Data General and announces the first commercial 16-bit minicomputer, the Nova.

1969
RCA brings out the high-end Spectra 70/60.

IBM targets small-business users with the System/3. GE expands the 600 family with its fastest system, the 655.

1970
DEC's sales force pounds the pavement to sell the



company's 16-bit PDP-11. IBM's 370/145 soon follows, along with the Burroughs B700 series.

Another alternative to IBM's 370/155 emerges as XDS introduces the Sigma 9. Univac develops the multiprocessor 1110.

1971
The IBM 370/135 and 195 debut. In response, Honeywell unveils its large-scale series, the 6000.

A buzzword is born: "distributed processing" is the key to Control Data's Cyber/70 mainframe family.

1972
Memorex follows DG into the distributed processing arena with the MRX/40 and 50.

Honeywell unwraps the Series 2000, while Burroughs nearly doubles its arsenal of medium-scale computers.

1973
Univac's medium-scale mainframe, the 90/60, debuts.

1974
Xerox switches to multiple processor architecture in its 550 and 560 mainframes.

CDC's Cyber/170 series features integrated-circuit logic and metal-oxide semiconductor memory.

The Honeywell systems hodgepodge gives way to a compatible group of CPUs in the Series 60.

1975
Ed Roberts and Bill Yates of MIT market Altair, the first personal computer.

IBM unwraps the System/32, and follows later in the year with the 5100.

The Cray-1 supercomputer is introduced as the fastest computer on earth. Univac shows its 1110/20 and 1110/40.

The last straw. A drastic dip in earnings forces Xerox to withdraw from the mainframe business.

New products — IMS Associates introduces the Hypercube II; the Tandem 16 Nonstop system arrives; Burroughs unveils its 800 series.

1976
Superminicomputers are introduced by Perkin-Elmer and Gould SEL, followed shortly by DEC's VAX-11/780 (in 1977) and Prime Computer's 750. The Series/1 is thrown into the minicomputer fray by IBM.

Continued on page 20th/32

ILLUSTRATIONS BY CHRIS DEMAREST

From page 20th/31

Burroughs brings out the B80 while the HP 3000 Series II debuts from Hewlett-Packard. CDC introduces the Cyber/70 Model 71.

1977

Steve Wozniak and Steve Jobs found Apple Computer, Inc. and market the garage-born Apple II microcomputer. Through Radio Shack, Tandy Corp. mass-markets its first TRS-80 microcomputer.

IBM unveils the 3033, the first of its 30 series. Itel reacts within six hours of IBM's announcement by unwrapping the AS/6. Burroughs follows Itel and brings out the B6817. Not to be undone, Honeywell restructures its Level 68 large-scale line.

NCR unleashes the N-8350, N-8450, V-8450, N-8560 and V-8560.

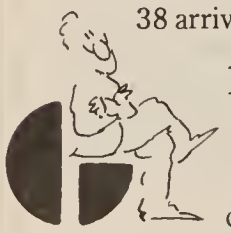
1978

National Semiconductor introduces the System 400.

Magnuson Systems pits itself against IBM when it markets the M80 series. Cambridge Memories also enters the IBM 370-compatible fray with three processors.

The HP 3000 Series III and the HP 250 bow from HP.

At last, IBM joins the distributed processing market with the 8100. The System/38 arrives.



1979

Perkin-Elmer undercuts the competition with its 32-bit, 4M-byte supermini, at $33,500.

NCR brings out the 8500 series, Burroughs unveils the B2930 and B3950, and Univac reacts with the 1100/60.

1980

DEC introduces its first large-scale integrated 32-bit mini, the VAX-11/750. DG unwraps the Eclipse MV/8000.

IBM's 3081 and 3033S processors debut. Amdahl comes in swinging with two computers — the 470V/7C and the 470V/7.

1981

Heads turn when Adam Osborne markets the Osborne Portable 1 portable microcomputer.

Apple, Tandy and Commodore quiver as IBM plunges into the micro market with the IBM PC.

Perkin-Elmer undercuts DEC and DG 16-bit computers with a 32-bit processor.

1982

DEC brings out a high-end 32-bit VAX-11 multiprocessing supermini, the 11/730.

Perkin-Elmer responds quickly with the high-end 32-bit Series 3200 processor.

NAS takes on the IBM 4341 with a medium-scale processor family — the AS/6100.

Sperry Univac introduces the 1100/90. IBM announces its largest processor to date, the 3084. Honeywell follows with the DPS 88.

1983

Apple hopes to shake up the office systems market with Lisa. The Apple IIE also bows.

IBM's "Peanut" comes out

of its shell as the PCjr. At NCC, IBM unveils the System/36.

The NCR 9300 and the 32-bit Honeywell DPS 6/95 bow.

1984

Apple comes to market with the Macintosh.

Gould's Computer Systems Division introduces its first virtual-memory processor, the Powernode 600.

AT&T plunges aggressively into the commercial computer market with the 3B line. IBM buoys its PC sales by unveiling the PC AT.

Wang expands its mid-range VS product line with the VS 65 minicomputer. The Micro PDP-11/73 from DEC bows.

1985

IBM's 3090 Model 200 and the 3090 Model 400 debut. Strong competition forces

the company to curtail production of the PCjr.

The Microvax II and the VAX 8650 superminicomputer are unveiled by DEC.

1986

IBM designs its first 32-bit workstation — the RT PC. HP also uses RISC technology in its Series 930 and 950.

Sperry bolsters its product line with the 2200/200.

DG introduces the MV/7800. Sun introduces the Sun-3/110LC and Sun-3/200.
IBM brings out the XT Model 286 and its 9370 minis.

Compaq's Deskpro 386 is first PC to use Intel's 80386.

Sperry gives in to a takeover by Burroughs following two weeks of tense negotiations.

1987

Wang restuctures the top half of its minicomputer line with the VS 7000 series.

IBM attempts to grab control of the corporate micro standard with its Personal System/2. Apple unveils the Macintosh SE and the Macintosh II.

Recently formed Honeywell Bull, Inc. — a company formed by Honeywell, Compagnie des Machines Bull and NEC — presents the DPS 7000 to the U.S.

Prime astounds rivals with a pair of superminis that the company claims pit Prime machines against IBM mainframes.

ILLUSTRATIONS BY CHRIS DEMAREST

Flashbacks

JUNE 7, 1982

FORMER IBM EMPLOYEE KILLS TWO

A former IBM employee goes on a shooting rampage at IBM's Federal Systems Division in Bethesda, Md., killing two employees and injuring eight others.

JULY 4, 1983

THREAT TO OLSEN TRIGGERS FEAR FOR EXECS

A Green Beret is charged with the attempted extortion of $1.25 million from Kenneth Olsen, president and founder of Digital Equipment Corp. U.S. Army Staff Sgt. Marc E. McDonnell, 27, is held on bail pending a hearing.

JULY 30, 1984

HOUSE OKS COMPUTER CRIME BILL

The U.S. House of Representatives takes less than


COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Staff Turnover No Problem, Surveyed Managers Report
Computers to Fuel April Lift-Off Of Space Shuttle 'Columbia'
Contract Closes Union Dispute
Timeplex Unveils Synchronous Modems

45 minutes to approve a major computer crime bill that covers unauthorized access to computers used in interstate commerce and the federal government.

FEBRUARY 11, 1985

SALARY GAP PERVADES DP

The Bureau of Labor Statistics reports that women earn almost 22% less than men in computer-related jobs.

JULY 8, 1985

REAGAN SECURITY DIRECTIVE ATTACKED

Congress warns that "Big Brother is here," that is, in a presidential directive that Congress claims gives U.S. military and intelligence officials too much control over computer security in the private sector.

JULY 28, 1986

BIG EIGHT FIRM TIED TO 4GL SNAFU

The New Jersey State Commission of Investigation charges that Price Water-


COMPUTERWORLD
Cullinet exec out in shuffle
Burroughs in dive dispute with big users
Aims move woos corporate users

house caused a monumental systems logjam at the state's Department of Motor Vehicles when the company misused a fourth-generation language in an attempt to revamp the agency's computer systems.

JANUARY 19, 1987

1-2-3 SUE! LOTUS VS. CLONES

Lotus Development Corp. files landmark lawsuits against Paperback Software International, Inc. and Mosaic Software, Inc., alleging that the two firms violated copyright law with products that steal the "look and feel" of Lotus's 1-2-3 spreadsheet product.

APRIL 13, 1987

LOTUS SUED FOR VISICALC "COPY"

Lotus Development Corp.'s "look and feel" suit takes an unexpected turn when SAPC, Inc. — a firm made up of ex-Software Arts, Inc. executives — charges Lotus and company founder Mitch Kapor with copying "the total concept, look and feel" of the once-popular Visicalc. Software Arts originally introduced Visicalc, a spreadsheet software product that by 1985 had lost much of its market to 1-2-3.

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